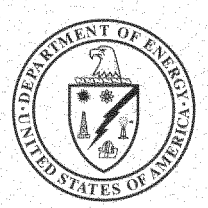
DOE/ID-11013
Revision 0
January 2003



U.S. Department of Energy
Idaho Operations Office

In Situ Bioremediation Remedial Design, Test Area North, Operable Unit 1-07B

Idaho National Engineering and Environmental Laboratory

DOE/ID-11013
Revision 0

In Situ Bioremediation Remedial Design, Test Area North, Operable Unit 1-07B

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January 2003

Prepared for the
U.S. Department of Energy
Idaho Operations Office

ABSTRACT

This remedial design supports the In Situ Bioremediation Remedial Action Work Plan and the technical and functional requirements, specifying the layout and construction details of the in situ bioremediation facility and ancillary equipment. The final remedial action covers the implementation of all components for restoration of the contaminated groundwater plume at Test Area North of the Idaho National Engineering and Environmental Laboratory in accordance with the 2001 Operable Unit 1-07B Record of Decision Amendment.

CONTENTS

ACRONYMS

ANSI	American National Standards Institute
DOE-ID	U.S. Department of Energy Idaho Operations Office
IBC	International Building Code
INEEL	Idaho National Engineering and Environmental Laboratory
ISB	in situ bioremediation
OU	operable unit
MCP	management control procedure
PLN	plan
TFR	technical and functional requirement
TAN	Test Area North
TSF	Technical Support Facility

In Situ Bioremediation Remedial Design, Test Area North, Operable Unit 1-07B

1. DESIGN OVERVIEW

The in situ bioremediation (ISB) injection system described in this document will provide the capability to blend various amendments with potable water for injection in support of the hot spot final remedial action, as described in the *Remedial Design/Remedial Action Scope of Work Test Area North Final Groundwater Remediation Operable Unit 1-07B* (U.S. Department of Energy Idaho Operations Office [DOE-ID] 2001). This system will support the long-term cleanup of the high-concentration portion of the plume and the removal of secondary source located within the hot spot.

This document describes the ISB injection system design and is based on the system requirements established in the "Technical and Functional Requirements for the In Situ Bioremediation Design at TAN, OU 1-07B" (Technical and Functional Requirement [TFR] -2539) and *In Situ Bioremediation Remedial Action Work Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2003).

A fire hazard analysis is not required for a facility of this type. An annual fire assessment will be performed before operations, but is not necessary in support of this design.

A table summarizing the Agency review comments and associated comment resolutions that were incorporated into this document can be found in Appendix A.

1.1 In Situ Bioremediation Operations and Maintenance Implementation

The following list is a summary of the general design parameters that were established in the ISB TFRs:

- The injection system will provide the components needed to inject the designated amendments (blended with potable water) into three wells located within a 100-ft radius of Technical Support Facility (TSF) -05
- The system will be capable of injecting the ISB amendment solution into each of the three different wells individually, at flow rates between 76 L/min (20 gpm) and 189 L/min (50 gpm)
- As a minimum, the system will have the capability to inject amendment solution 10 hours/day for up to 4 days/week
- The system will be designed for a 15-year operating life
- The system must be able to perform periodic injections year-round
- The system must be capable of injecting three different amendment types: (1) sodium lactate, (2) powder (whey or lactose), and (3) molasses.

2. SYSTEM DESCRIPTION

2.1 General

The ISB components will consist of the process equipment, building, and associated injection and monitoring wells needed to do the following:

1. Store amendment in such a way that product degradation does not occur
2. Blend amendment solutions with potable water before injection
3. Inject the nutrient solution into TSF-05 and two other injection wells within a 100-ft radius of TSF-05 (Test Area North [TAN] -31 and a new injection well)
4. Provide the laboratory space needed to complete onsite analytical analyses.

In addition, the ISB is required to comply with local building codes:

- Code of record: *International Building Code* (IBC) 2000 edition (IBC 2000)
- IBC occupancy class: F-2
- IBC construction class: Type IIB.

Detailed design drawings for the injection system are provided in Appendix B, associated construction specifications are provided in Appendix C, and the design calculations are provided in Appendix D.

2.2 Process Equipment

The injection process is composed of three distinct elements. The first element is the storage and handling equipment, which is unique to each amendment type and depends on the method of shipment used. The second element is the amendment solution preparation equipment, which is unique to the method of blending used. And the third element is the solution injection equipment, which is common to all three amendment types.

2.2.1 Storage and Handling Equipment

Sodium lactate and molasses will be shipped and stored in 275-gal totes. Amendment powder (whey or lactose) will be shipped and stored in 2,000-lb supersacks. To transfer each nutrient from the shipping containers into the solution-preparation equipment requires an electric pallet jack to stage the pallet and either a pump or lifting device to transfer the amendment.

The 275-gal totes used for molasses and sodium lactate will be shipped with a quick-disconnect spout located on the bottom of the tote. A bi-rotor pump will be used to inject the high-viscosity liquids into the potable water stream.

A packaged powder-handling system will be used for the 2,000-lb supersacks of powder (whey or lactose). An integrated hoist will be used to lift the supersacks into position above a bulk bag unloader and then hold them in place while the powder is educed into the potable water stream. Storage of all pallets will be accomplished without stacking.

2.2.2 Solution Preparation Equipment

The amendment injection will be performed in a continuous flow scenario. Influent amendment and potable water flow will be manually set to a steady state depending on the amendment concentration desired. The liquid amendment will be injected directly into the potable water line and injected into the desired well.

In order to inject the powdered amendment using a continuous flow, a separated feed system will be used. The powder feed system will consist of a vibrating bulk bag unloader system, a metered screw drive, a small washdown hopper, and an injection eductor. The eductor's effluent will be injected directly into the potable water line and then out to the desired injection well.

2.3 Process Building

The process building will be divided into four areas: (1) a process equipment area, (2) a nutrient storage area, (3) a laboratory, and (4) an office area. The process equipment area will house the bulk bag unloader, pump, eductor, piping, and instrumentation associated with the injection process. The nutrient storage area will provide a heated storage area to prevent degradation of the nutrient and to help stabilize the temperature. Shelving at the rear of the nutrient storage area will provide space to house spare parts for the injection process equipment. The laboratory will be used to support sampling activities and perform analyses and other activities associated with monitoring activities in support of the remedial action. The office area will be used for various activities required of operators of the New Pump and Treat Facility and ISB facilities as well as laboratory personnel. The overall building size is approximately 40 ft × 30 ft, with an interior height ranging from 10 ft in the office and laboratory to 20 ft in the process and storage areas. The building will have a concrete floor.

2.4 Injection Wells

Amendment solution will be injected into TSF-05 and two other wells within a 100-ft radius of TSF-05. (See Appendix D for well drilling specifications.) Water will be injected into any of the three wells individually at flow rates between 76 L/min (20 gpm) and 189 L/min (50 gpm). The actual flow rate for an injection event will be manually controlled using valves in a manifold system in the process building. The piping to each well will be routed underground from the process building to the injection wells and joined with the downhole piping at the wellhead.

2.5 System Controls

Process control indicators will be provided to allow operational control during injection operations using manual valves to set process flow rates. Data monitoring and recording may be performed using independent data loggers such as the Hermit data loggers currently used for groundwater-level monitoring.

2.6 Utilities

A pole-mounted 300-KVA 13,800/480-V step-down transformer will supply electrical power. The 480-V three-phase overhead line originally installed to supply power to the Groundwater Treatment Facility will be brought into the ISB building. A 480/120-V transformer will be surface mounted and will supply a 120-V distribution panel. The 120-V distribution panel will include circuits for lighting, receptacles, and control power. Circuits also will be provided to power the Comprehensive Environmental Response, Compensation, and Liability Act Waste Storage Units and the existing ISB injection seavan. Potable water will be supplied by the existing TSF potable water/firewater supply system.

3. EQUIPMENT LIST

Table 3-1 provides a list of the major components for the ISB injection system.

Table 3-1. Major equipment list and description.

ID No.	QTY	Equipment	Description
PI1	1	Pressure indicator	Ashcroft pressure gauge, P/N 45-1279-04L-0/160, ½-in. NPT connection, 0–160 psig
PI2 PI3 PI4	3	Pressure indicator	Ashcroft pressure gauge, P/N 45-1279-04L-0/30, ½-in. NPT connection, 0–30 psig
PS1	1	Pressure switch	Dwyer pressure switch, P/N DA-31-153-4, ¼-in. NPT connection, 1–35 psig adjustable range
FI1 FI2	1	Flow indicator	Rosemount magnetic flow meter, P/N 8711THE020U1N0 flow tube with P/N 8732CT12N0M4T1 transmitter, 2-in. integral mounting configuration
FI3	1	Flow indicator	MicroMotion coriolis flow meter, P/N R200S341NCAAEZZZZ R-series sensor with P/N 1700I11ABAEZZZ transmitter, 2-in. ANSI 150# flange connection
FI4	1	Flow indicator	Kobold direct-read flow meter, P/N RCM-5318-D-VUR RCM style, 1-in. process connection, vertical mount with gauge at right
SP-103	1	Bulk bag unloader	VibraScrew Model II VHD bulk bag unloader with vibration discharge (2/3 hp) and hoist/trolley (3 hp)
		Powder screw feeder	VibraScrew VersiFeeder vibrating feeder with vibrator (3/4 hp) and surge hopper level probe
P-101	1	Hi viscosity liquid injection pump	Viking HD internal gear pump, P/N HL124AD, 2-in. flanged connection, 3 hp
E-101	1	Powder eductor	Elmridge powder injection eductor, P/N FBTLSS5, 1-in. 150# ANSI RF flange inlet, 1-½-in. 150# ANSI RF flange suction and discharge, with 1-½-ft^3 washdown hopper, P/N ESxxxx, 1-½-in. 150# ANSI FF flange discharge
SP-104	1	Backflow preventer	2-in. reduced-pressure principle backflow prevention assembly, 175 psi working pressure, bronze body, removable seat discs, replaceable seats, with isolation valves at each end, without strainer, Watts International, Series 009 M2QT
SP-105	3	Vacuum breaker	1-¼-in. pressure-type vacuum breaker, Conbraco, Series 40-500
SP-108	1	Deionized water equipment	Barnstead D0800, deionizes 5–10 gph
SP-109	1	Flammable cabinet	Justrite 25720, 12 × 43 × 44 in. with five adjustable shelves
SP-110	1	Fume hood	Labconco 28044-00, 25 × 28 × 45-in. fiberglass hood with bypass airflow, tempered glass sash, and built-in 1/10-hp blower
SP-111	1	Acid cabinet	Labconco 35820-00 with flat epoxy work surface for 28-in. hood
CV1 CV2 CV3	3	Check valve	1-½-in. bronze check valve, 125 WSP pressure rating, CV series, Watts International, 700360
CV4	1	Check valve	5/8-in. bronze check valve, 125 WSP pressure rating, CV series, Watts International, 700360

ANSI = American National Standards Institute

4. ASSUMPTIONS

The following assumptions are applicable to the ISB remedial design:

1. Potable water service will be available at TAN via the TSF firewater system for the duration of the remedial action.

2. Three injection wells will be sufficient to allow nutrients to be dispersed over the entire secondary-source materials.

5. QUALITY LEVEL

The applicable quality level for all system components will be determined in accordance with the "Project Management Plan–Environmental Restoration Program Management" (Plan [PLN] -694) and Management Control Procedure (MCP) -540, "Documenting the Safety Category of Structures, Systems, and Components." A quality level review will be performed after the design is final, during the procurement process. All required acceptance testing and inspections will be compiled into a construction inspection plan. This plan will be used during construction and will address all construction hold points listed in the specifications.

6. REFERENCES

DOE-ID, 2001, *Remedial Design/Remedial Action Scope of Work Test Area North Final Groundwater Remediation Operable Unit 1-07B*, DOE/ID-10905, Rev. 1, U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho, November 2001.

DOE-ID, 2003, *In Situ Bioremediation Remedial Action Work Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B*, DOE/ID-11015, Rev. 1, U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho, January 2003.

IBC, 2000, *International Building Code,* First Edition, ISBM 1892395258, International Code Council, Falls Church, Virginia.

MCP-540, 2001, "Documenting the Safety Category of Structures, Systems, and Components," Rev. 13, *Manual 10A–Engineering and Research*, March 2001.

PLN-694, 2000, "Project Management Plan–Environmental Restoration Program Management," Rev. 0, *Manual 7–Project Management*, November 2000.

TFR-2539, 2002, "Technical and Functional Requirements for the In Situ Bioremediation Design at TAN, OU 1-07B," Rev. 0, Environmental Restoration, March 2002.

Appendix A

Agency Comments and Comment Resolutions

Appendix A

Agency Comments and Comment Resolutions
ISB Remedial Design

Comment No.	Section / Page No.	Comment	Resolution
EPA 1.	Section 2.2.1 2-1	Will there be a rodent problem in storing lactose in supersacks?	The bulk bags are made to withstand tipical rodent problems. Routine operations and inspections will also address this possible problem.
EPA 2.	Dwg A-1	Given the small size of the office area, is there a need for a door? Also, under drawing M-1 there are no HVAC systems in the upper mezzanine so the door may need to remain open to support ventilation.	There is an HVAC unit in the office area. The drawing has been revised to show the unit.
EPA 3.	Dwg A-1	The space between the outside door (3) and the stairs appears very tight. It may be valuable to extend this distance by 6".	The area does meet building standards. However the stairway way move to provide an additional 6” at the stair landing.
EPA 4.	Dwg A-2	Has an evaluation of whether an exclusion zone is required under the fume hood exhaust?	A hazard evaluation was performed for the selection of the hood. There is no need for an exclusion zone around the exhaust.
EPA 5.	Dwg C-1	Although only food grade product material and potable water are being processed in the building, it does not appear that any provision is made for a sump to simplify the collection of spills?	There is no sump included in the floor of the facility. Any spills will be localized and cleaned at the point of discharge. The majority of the nutrients do not have a tendency to flow real well and will stay in the spill area.
EPA 6.	Dwg C-3	As the septic system is being placed 100 feet from the ISB Building, a 2% minimum slope requires the drain field to be at least 24" bgs?	This is true if the entire land surface is level, and the drain field may be 24 “ bgs. However, if the ground surface slopes toward the drain field there may be less than 24”. If this is the case the re must at least be 1’ of cover. This is the code requirement. Therefore it is called out as a minimum.

Comment No.	Section / Page No.	Comment	Resolution
IDEQ 1.	Dwg C-3	It appears that a 12-inch minimum backfill would not offer adequate freeze protection for the septic system.	The 1' minimum backfill is in accordance with the plumbing code.
IDEQ 2.	Dwg C-3	It is recommended that guard posts be placed by the septic tank covers to aid in finding the covers should they become covered by soil, debris, or snow, and to prevent the inadvertent placement of heavy equipment of vehicles on the covers.	Agree. Guard posts were added.
IDEQ 3.	Dwg G-4	OU 1-07B ISB Process Flow Diagram	A check valve was added to the facility water supply line.
IDEQ 4.	2.1.2 5&6	Items 1 and 5 refer to the use of flush joint (Schedule 40) carbon steel casing in 16-inch and 10-inch diameters. Please verify that these casing diameters are available as "flush joint" pipe and in left-hand thread. Figure 2-1, page 4, is not consistent with the text noted. The figure refers to the use of 10-inch stainless steel casing but the text on page 5 refers to carbon steel casing. Please correct as needed. These same issues appear in Section 2.2 on page 6. Item 5 refers to the use "Number 8 sodium bentonite chips" but Figure 2-1 refers to a 10-foot cement plug at the bottom of the 10-inch casing. Please correct as needed. Item 6 refers to the placement of "Groundwater containment devices" but further explanation is not provided. Please provide clarification.	Text was modified to remove the identified conflicts.

Appendix B

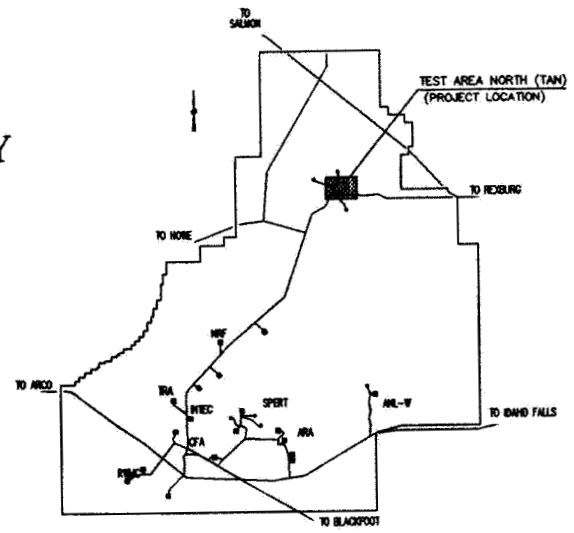
Drawings

U.S. DEPARTMENT OF ENERGY

IDAHO NATIONAL ENGINEERING & ENVIRONMENTAL LABORATORY

TEST AREA NORTH OU 1-07B

IN SITU BIOREMEDIATION (ISB) INJECTION SYSTEM



INDEX OF DRAWINGS

DWG NO	A/E SH NO	REV	TITLE
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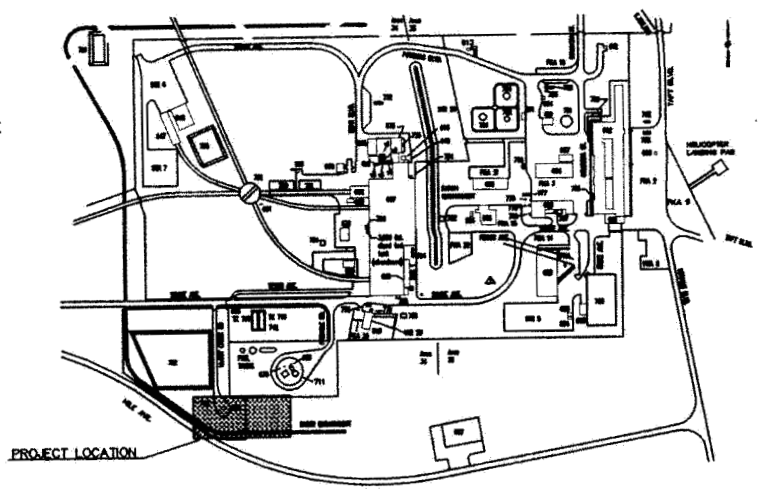
10301	G-2	0	GENERAL LEGEND SHEET
10302	G-3	0	SITE LAYOUT PLAN
10303	G-4	0	PROCESS FLOW DIAGRAM
10304	G-5	0	SITE DEMOLITION PLAN
10305	A-1	0	BUILDING LAYOUT
10306	A-2	0	BUILDING EXTERIOR ELEVATIONS
10307	A-3	0	SCHEDULES AND INTERIOR ELEVATIONS
10308	A-4	0	DOOR DETAILS
10309	A-5	0	LABORATORY DETAILS
10310	C-1	0	FLOOR SLAB
10311	C-2	0	FOUNDATIONS DETAILS
10312	C-3	0	SEPTIC SYSTEM
10313	C-4	0	WELL SITEWORK DEMOLITION
10314	C-5	0	WELL SHELTERS
10315	M-1	0	HVAC DIAGRAM
10316	M-2	0	HVAC SCHEDULES
10317	P-1	0	PIPING AND INSTRUMENTATION DIAGRAM
10318	P-2	0	BUILDING PIPING ARRANGEMENT, ISOMETRIC
10319	P-3	0	PIPING DETAILS
10320	P-4	0	PIPING SECTIONS
10321	P-5	0	NEW INJECTION WELL DETAIL
10322	P-6	0	WELLHEAD DETAILS WELL DETAIL SCHEDULE
10323	P-7	0	BURIED PIPE DETAILS
10324	P-8	0	BULK BAG UNLOADER
10325	P-9	0	WATER & WASTEWATER LAYOUT
10326	P-10	0	INTERIOR WELL CAP 6"ø CASING
10327	P-11	0	EXTERIOR WELL CAP 1
10328	P-12	0	NEW WELL INTERIOR WELL CAP
10330	E-1	0	ONE-LINE DIAGRAM
10331	E-2	0	ELECTRICAL SITE PLAN
10332	E-3	0	ELECTRICAL POWER PLAN
10333	E-4	0	LIGHTING/ANCILLARY PLAN
10334	E-5	0	BUILDING GROUNDING PLAN
10335	E-6	0	PANEL SCHEDULES



PROJECT LOCATION PLAN

PROFESSIONAL ENGINEER REGISTERED 1/6/03 7065 STATE OF IDAHO GARY D. MECHAM

REV	DATE	DESCRIPTION	BY

NOTES

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DRAWING NO.	DRAWING TITLE

OU 1-07B ISB
TITLE SHEET & INDEX

INTREPID Engineering Services
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G-1

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DESIGNED:		SAFETY CATEGORY: CC
CHECKED: G MECHAM	10/17/02	DRAWING NUMBER 10300 REV 0
APPROVED:		
CADD FILE: 10300_0.DWG		

PIPING SYMBOLS

- GLOBE VALVE
- BALL VALVE
- GATE VALVE
- THREE WAY VALVE
- CHECK VALVE
- MOTOR OPERATED VALVE
- REDUCER
- FLOW ELEMENT
- HOSE CONNECTION
- VACUUM BREAKER
- EYE WASH

PIPING SYMBOLOGY

- PROCESS FLOW ARROW
- FLEXIBLE HOSE
- SP-X SAMPLE POINT

WELLHEAD SYMBOLOGY

- WELL LOCATION
- WATER SURFACE ELEVATON

ELECTRICAL

- LEVEL SWITCH
- CLOSED CONTACT (BREAK)
- OPEN CONTACT (MAKE)
- THERMAL ELEMENT
- CIRCUIT BREAKER
- FUSE
- TRANSFORMER
- GROUND

EQUIPMENT SYMBOLS

- SPECIALTY ITEM
- BACKFLOW PREVENTER
- PUMP
- BULK BAG UNLOADER
- EDUCTOR

HEATING/VENTILATION SYMBOLS

- UNIT HEATER
- WALL MOUNTED THERMOSTAT
- ROOF FAN
- WALL MOUNTED FAN
- STATIC PRESSURE CLASS CHANGE
- FLEXIBLE CONNECTION
- POWER OR GRAVITY ROOF VENTILATOR - EXHAUST

INSTRUMENT DEVICE TAG TYPES

- XX 000 — IN-LINE TAG WITH LEADER LINE
- XX 000 — LOCAL MOUNTED DEVICE
- XX 000 — FRONT OF PANEL MOUNTED DEVICE
- HS 100 HOA — SPECIAL DESIGNATION; LETTERS OF INSTRUMENT DESIGNATION; LOOP NUMBER

INSTRUMENT IN-LINE DEVICES

- M — MAGNETIC FLOW METER
- CORIOLIS METER

INSTRUMENT SIGNAL LINES

- CONNECT TO PROCESS
- ELECTRIC INSTRUMENT SIGNAL
- SOFTWARE LINK

IDENTIFICATION LETTERS

	FIRST-LETTER		SUCCEEDING-LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE (1)			CONTROL	
D	USER'S CHOICE (1)	DIFFERENTIAL (4)			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION) (4)			
G	USER'S CHOICE (1)		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN (7)			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE (4,21)		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	USER'S CHOICE (1)	MOMENTARY (4)			MIDDLE, INTERMEDIATE
N	USER'S CHOICE (1)		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE (1)		ORIFICE (RESTRICTION)		
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS			
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

NOTE: THIS TABLE APPLIES ONLY TO THE FUNCTIONAL IDENTIFICATION OF INSTRUMENTS. NUMBERS IN PARENTHESES REFER TO EXPLANATORY NOTES ON PAGES 15 AND 16 OF THE INSTRUMENT SOCIETY OF AMERICA AMERICAN NATIONAL STANDARD INSTRUMENTATION SYMBOLS AND IDENTIFICATION.

INSTRUMENT SPECIAL DESIGNATION	
DESIGNATION	FUNCTION / ABBREVIATION
HOA	HAND-OFF-AUTO
S/S	START-STOP
ESD	EMERGENCY SHUTDOWN

PROFESSIONAL ENGINEER REGISTERED 1/6/03 7065 STATE OF IDAHO GARY D. MECHAM

NOTES

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

OU 1-07B ISB
GENERAL LEGEND SHEET

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G-2

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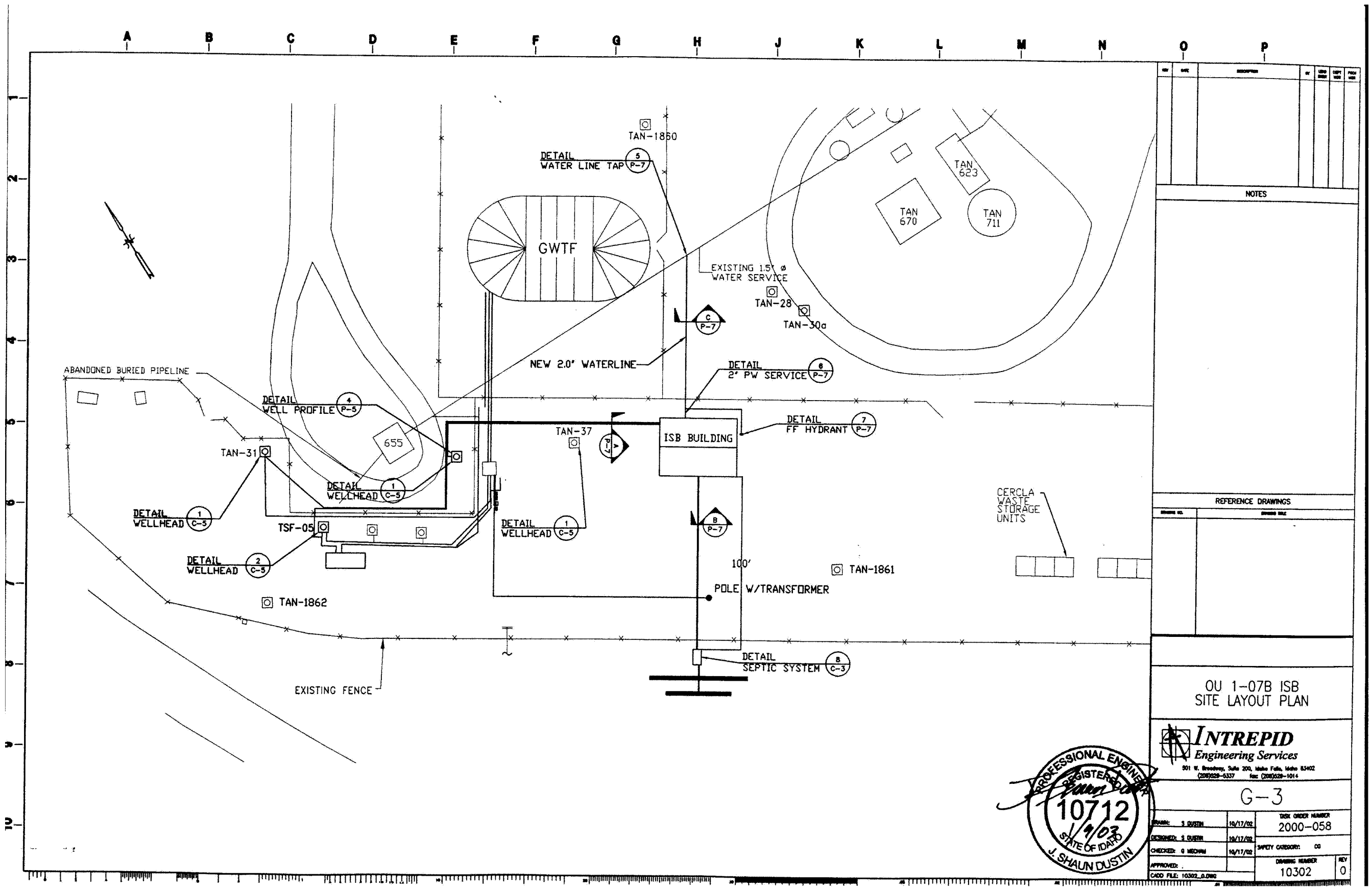
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TAN-30a
C P-7
NEW 2.0" WATERLINE
DETAIL 2" PW SERVICE 6 P-7
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A P-7
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DETAIL WELLHEAD 1 C-5
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DETAIL WELLHEAD 2 C-5
DETAIL WELLHEAD 1 C-5
B P-7
CERCLA WASTE STORAGE UNITS
100'
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POLE W/TRANSFORMER
TAN-1862
DETAIL SEPTIC SYSTEM 8 C-3
EXISTING FENCE
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INTREPID
Engineering Services
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DESIGNED: S DUSTIN 10/17/02
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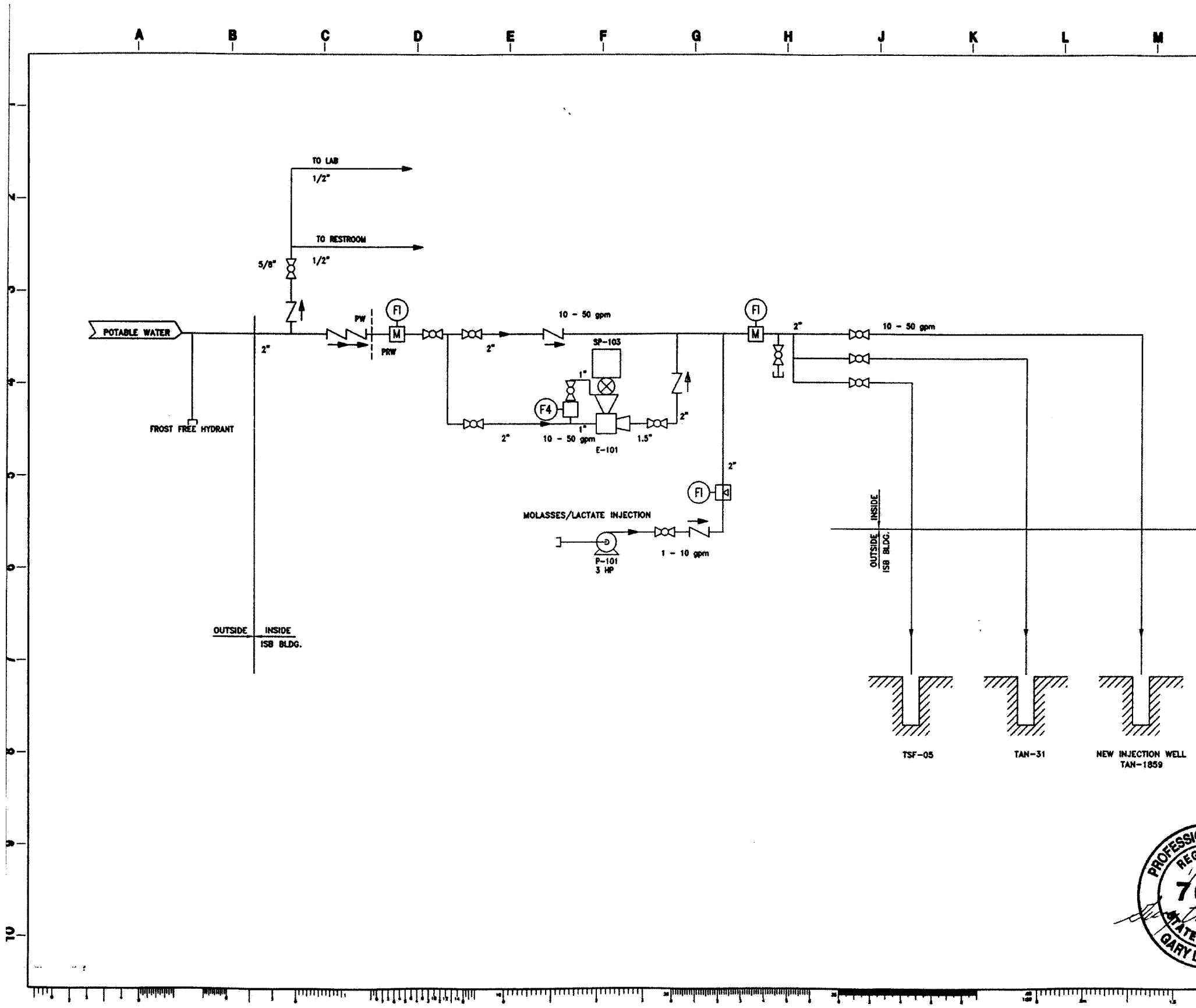

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REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

PROFESSIONAL ENGINEER REGISTERED 1/6/03 7065 STATE OF IDAHO GARY D. MECHAM

OU 1-07B
PROCESS FLOW DIAGRAM

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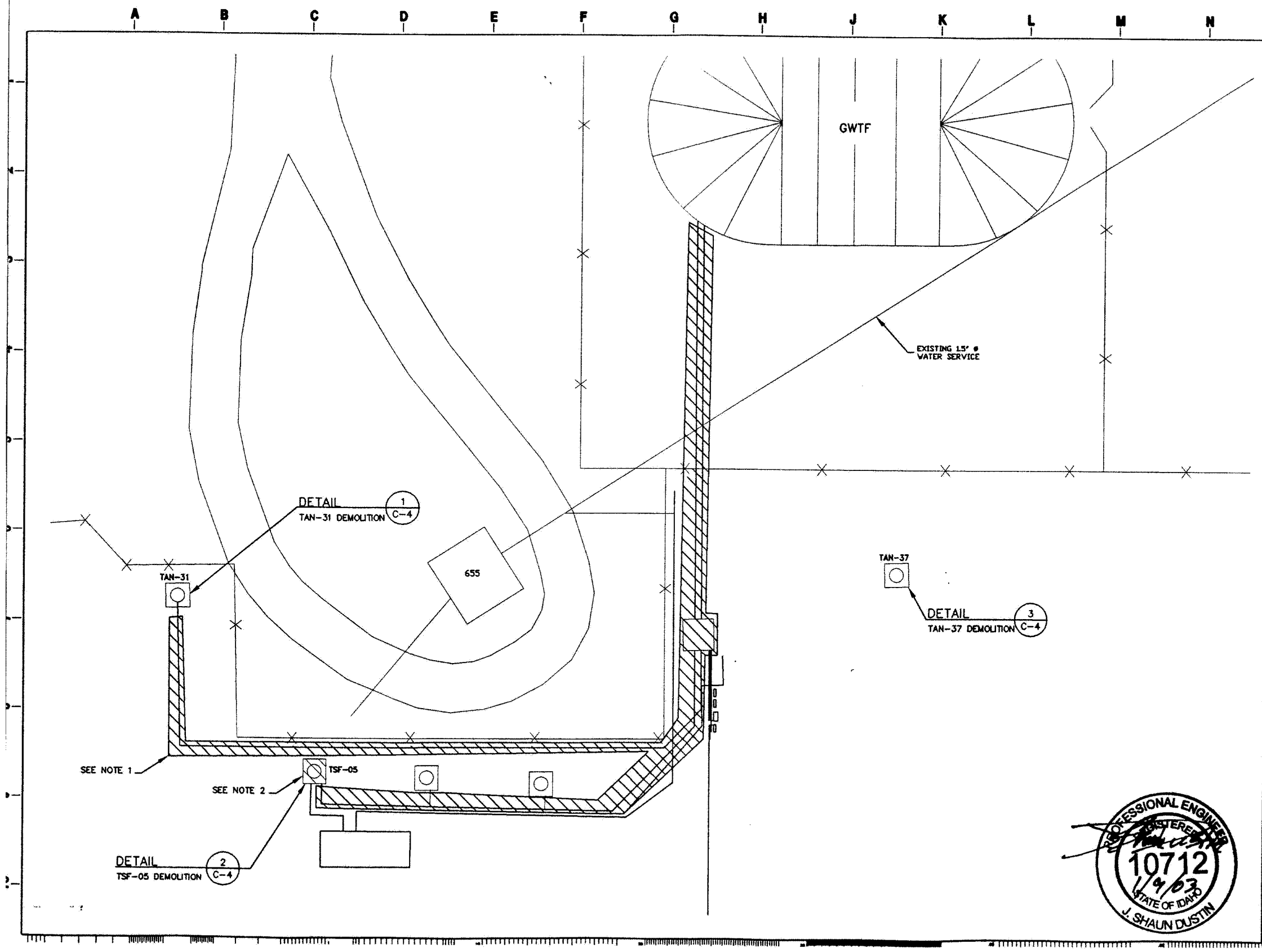
G-4

DRAWN: K MECHAM	10/17/02	TASK ORDER NUMBER 2000-058
DESIGNED: K KIMMELL	10/17/02	SAFETY CATEGORY: .CC
CHECKED: G MECHAM	10/17/02	DRAWING NUMBER 10303 REV 0
APPROVED: .		
CADD FILE: 10303_0.DWG		



REV	DATE	DESCRIPTION	BY	LEAD ENGR	PROJ MGR	PROG MGR

NOTES

1. HATCHED AREA INDICATES INTERNALLY CONTAMINATED ABOVE-GROUND PIPELINES, ELECTRICAL SERVICE, AND STRUCTURES TO BE REMOVED BY SUBCONTRACTOR.

2) RETAIN AND PROTECT CONCRETE PAD AND WELL FOR CONTINUED USE. ADDITIONAL DEMOLITION IN TSF-05 INCLUDES REMOVAL AND DISPOSAL OF ABANDONED PIPING AND STEEL BUILDING AS INDICATED ON SHEET C-5.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

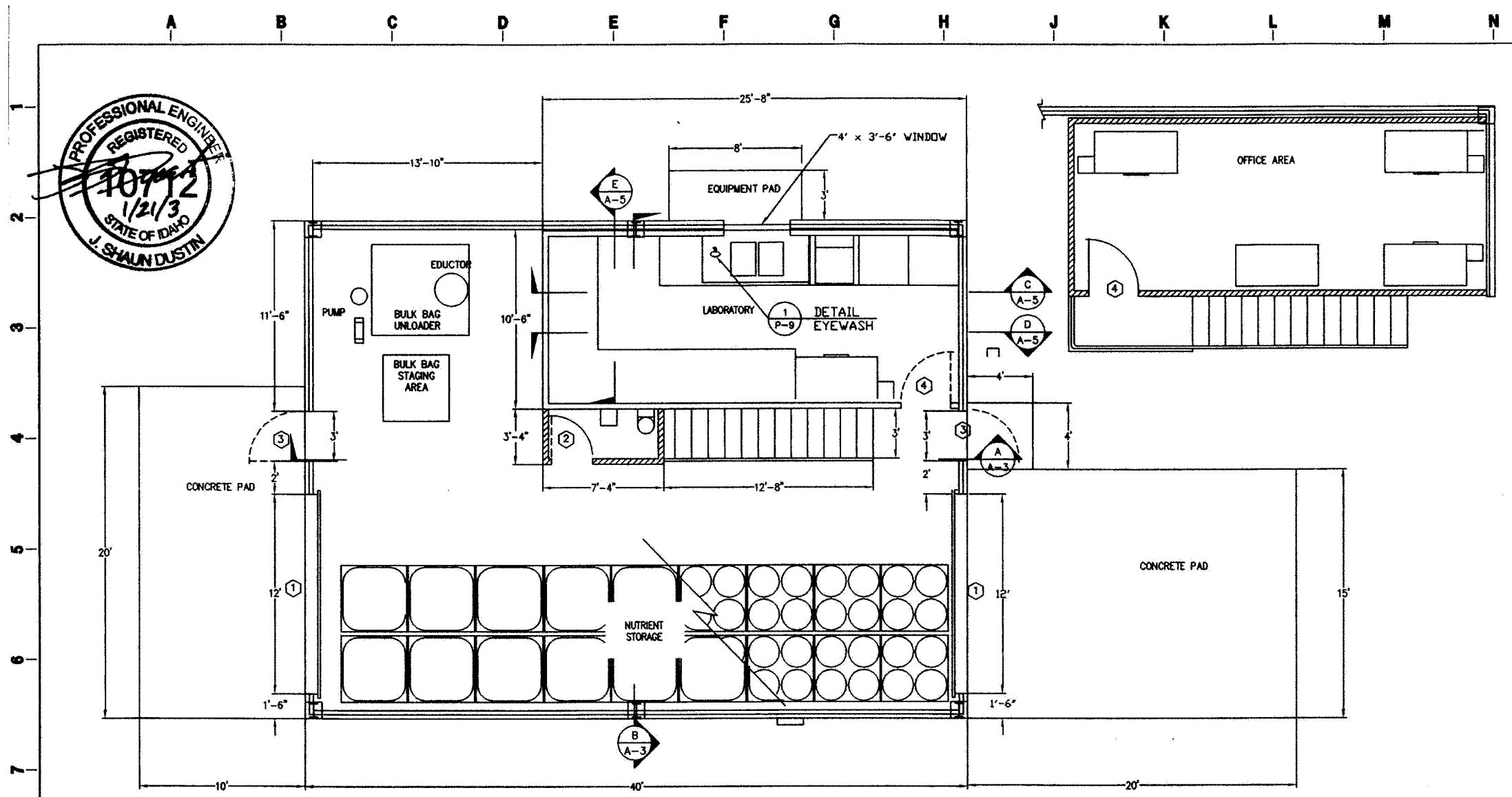
OU 1-07B ISB
SITE DEMOLITION PLAN

INTREPID
Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

G-5

DRAWN: S DUSTIN	10/17/02	TASK ORDER NUMBER 2000-058
DESIGNED: S DUSTIN	10/17/02	
CHECKED: G MECHAM	10/17/02	SAFETY CATEGORY: CG
APPROVED:		DRAWING NUMBER 10304 REV 0
CADD FILE: 10304_0.DWG		

PROFESSIONAL ENGINEER REGISTERED 10712 STATE OF IDAHO J. SHAUN DUSTIN 1/4/03



DOOR SCHEDULE

MARK	NOMINAL SIZE	TYPE	HDWE GROUP	DOOR			FRAME		DETAILS			GLASS TYPE	U.L. LABEL	REMARKS
				MAT.	CORE	FINISH	MAT.	FINISH	HEAD	JAMB	SILL			
1	12' x 14'	A	—	STEEL	INSUL	FACTORY	HOLLOW METAL	PAINTED	1/A-9	2/A-9	—	TEMPERED	—	SECTIONAL DOOR
2	2.5' x7' (MIN.)	B	1	HOLLOW METAL	—	FACTORY	HOLLOW METAL	PAINTED	BY MEZZANINE SUPPLIER			TEMPERED	—	
3	3' x 7'	C	1	HOLLOW METAL	INSUL	PAINTED	HOLLOW METAL	PAINTED	3/A-9	4/A-9	5/A-9	TEMPERED	—	BY BLDG SYS MFR
4	3' x 7'	D	1	HOLLOW METAL	INSUL	PAINTED	HOLLOW METAL	PAINTED	BY MEZZANINE SUPPLIER			TEMPERED	—	24" SQ LOUVER

WALL SCHEDULE

PLAN SYMBOL	DESCRIPTION	PLAN DETAIL
	INTERIOR WALL: LIGHT GAGE STEEL FRAMING WITH 5/8" GYP BD ON BOTH SIDES	5/8" PAINTED GYP BD & RESILIENT BASE VAPOR BARRIER INSULATION FLOOR TO CEILING STEEL WALL FRAMING SYSTEM BY DESIGN/BUILD
	PERIMETER METAL BLDG WALL: EXTERIOR METAL BLDG PANELS ON OUTSIDE 1/2" INSULATION/FINISH BD INSIDE WITH BLDG INSULATION IN BETWEEN	3" BATT INSULATED EXTERIOR METAL BLDG PANEL VAPOR BARRIER 2 1/2" RIGID BLDG INSULATION 1/2" INSULATION/FINISH BOARD

PROFESSIONAL ENGINEER REGISTERED 10712 1/21/3 STATE OF IDAHO J. SHAUN DUSTIN

REV	DATE	DESCRIPTION	BY

NOTES

REFERENCE DRAWINGS

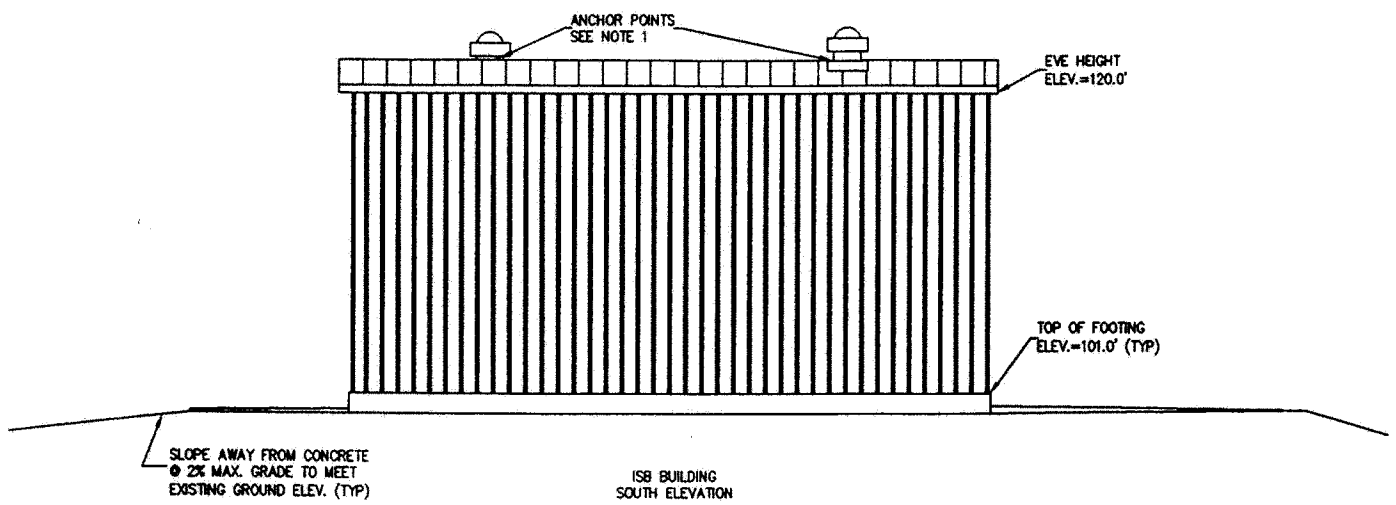
DRAWING NO.	DRAWING TITLE

OU 1-07B ISB
BUILDING LAYOUT

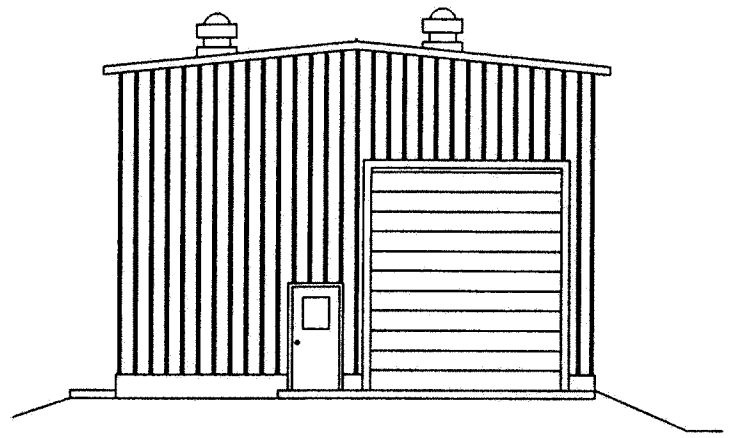
INTREPID Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

A-1

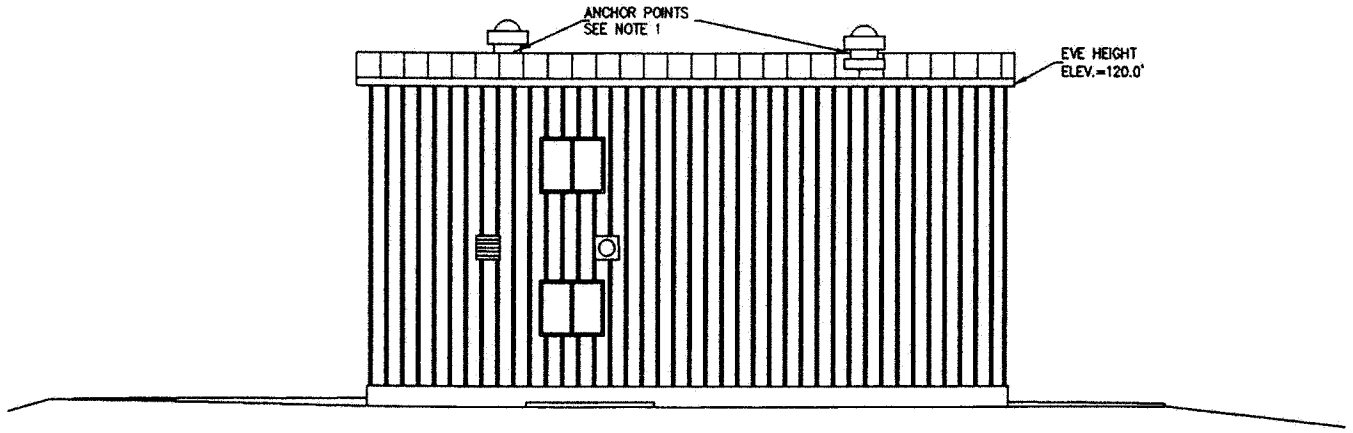
DRAWN: S DUSTIN	10/17/02	TASK ORDER NUMBER 2000-058
DESIGNED: S DUSTIN	10/17/02	SAFETY CATEGORY: .CG
CHECKED: G MECHAM	10/17/02	
APPROVED: .	.	DRAWING NUMBER 10305 / REV 0
CADD FILE: 10305_0.DWG		



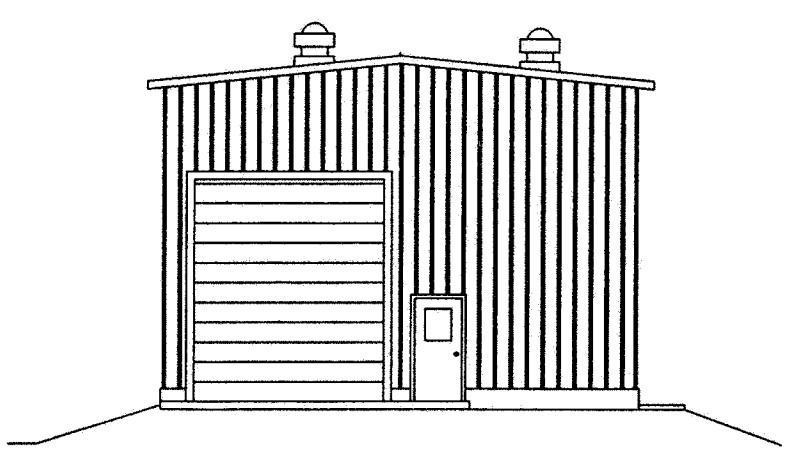
ISB BUILDING
SOUTH ELEVATION



ISB BUILDING
WEST ELEVATION



ISB BUILDING
NORTH ELEVATION



ISB BUILDING
EAST ELEVATION

REF	MARK	DESCRIPTION	QTY	LENGTH (FEET)	WEIGHT (LBS)	TOTAL (LBS)

NOTES

1) FALL PROTECTION ANCHOR POINTS RATED TO 5,000 LBS.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

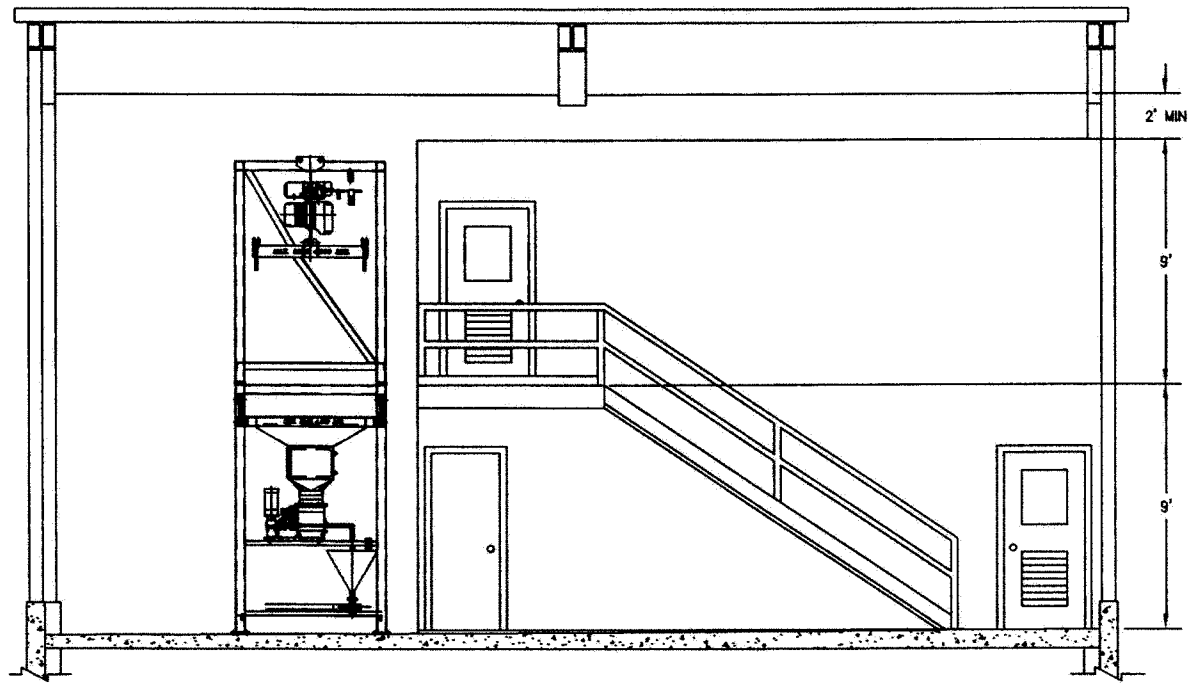
OU 1-07B ISB BUILDING EXTERIOR ELEVATIONS

INTREPID
Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax (208)529-1014

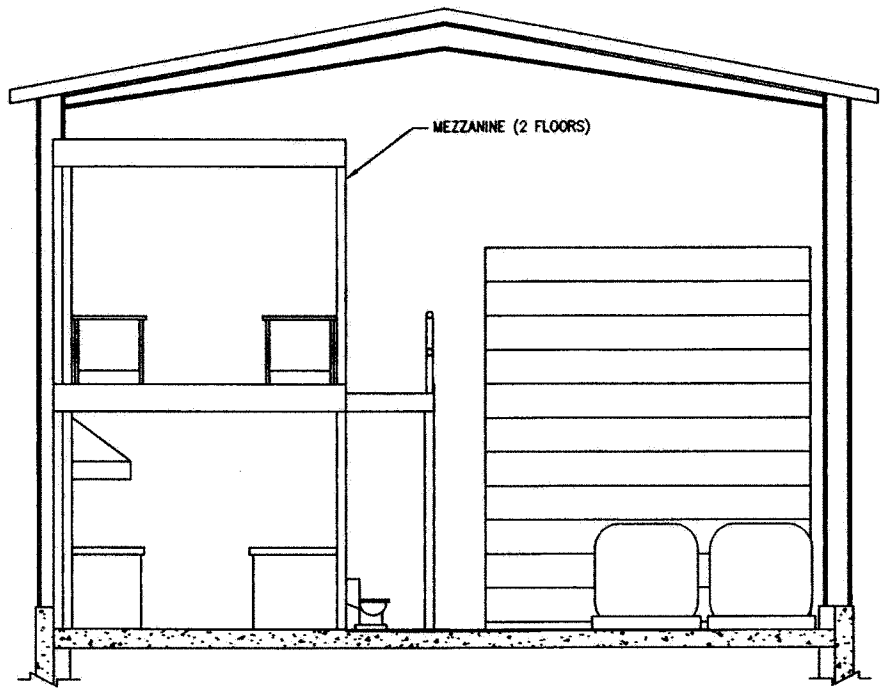
A-2

DRAWN: S DUSTIN	10/17/02	TASK ORDER NUMBER	2000-058
DESIGNED: S DUSTIN	10/17/02		
CHECKED: G MECHAM	10/17/02	SAFETY CATEGORY: CG	
APPROVED:		DRAWING NUMBER	REV 0
CADD FILE: 10306_0.DWG		10306	

PROFESSIONAL ENGINEER REGISTERED 10712 9/13 STATE OF IDAHO J. SHAUN DUSTIN



SECTION A/A-1
1"=3'



SECTION B/A-1
1"=3'

ROOM FINISH SCHEDULE

ROOM NAME	FLOOR: ADHESIVE TILE	FLOOR: CONCRETE SEALER	NORTH WALL: GYPSUM BD.	NORTH WALL: PAINT	NORTH WALL: INSULATION/FINISH BD	WEST WALL: GYPSUM BD.	WEST WALL: PAINT	WEST WALL: INSULATION/FINISH BD	SOUTH WALL: GYPSUM BD.	SOUTH WALL: PAINT	SOUTH WALL: INSULATION/FINISH BD	EAST WALL: GYPSUM BD.	EAST WALL: PAINT	EAST WALL: INSULATION/FINISH BD	CEILING: GYPSUM BD.	CEILING: PAINT	CEILING: INSULATION/FINISH BD	REMARKS
NUTRIENT STORAGE		•			•			•			•			•			•	
LAB		•		•			•			•			•			•		PAINT COLOR PER OWNER
OFFICE	•			•			•			•			•			•		PAINT COLOR PER OWNER

PROFESSIONAL ENGINEER REGISTERED 10/17/02 1/21/3 STATE OF IDAHO J. SHAUN DUSTIN

REV	DATE	DESCRIPTION	BY	LEAD CHECK	DEPT MGR	PROJ MGR

NOTES

1) THE MAZZANINE WILL INCLUDE A LABORATORY AND OFFICE SPACE. THE MEZZANINE SYSTEM SHALL BE A DESIGN BUILD SYSTEM SUPPLIED BY THE SUBCONTRACTOR IN ACCORDANCE WITH SPECIFICATION 13121.

REFERENCE DRAWINGS

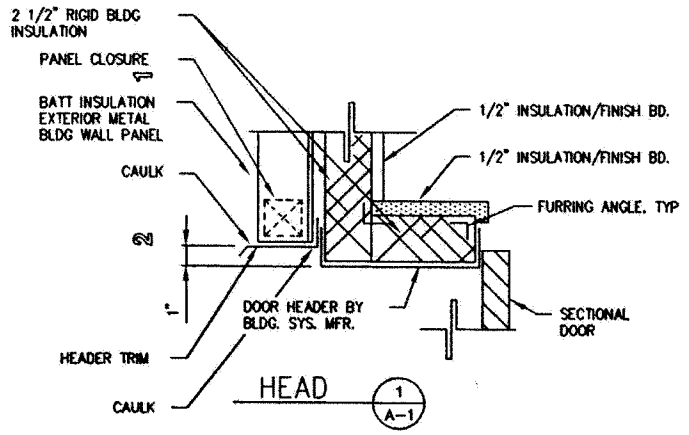
DRAWING NO.	DRAWING TITLE

OU 1-07B ISB
SCHEDULES AND
INTERIOR ELEVATIONS

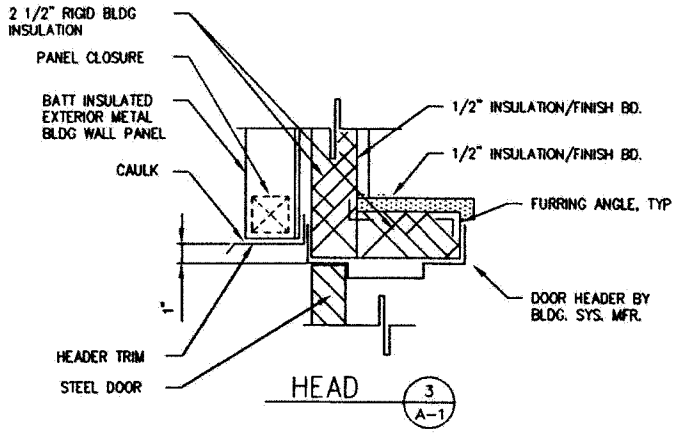
INTREPID Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

A-3

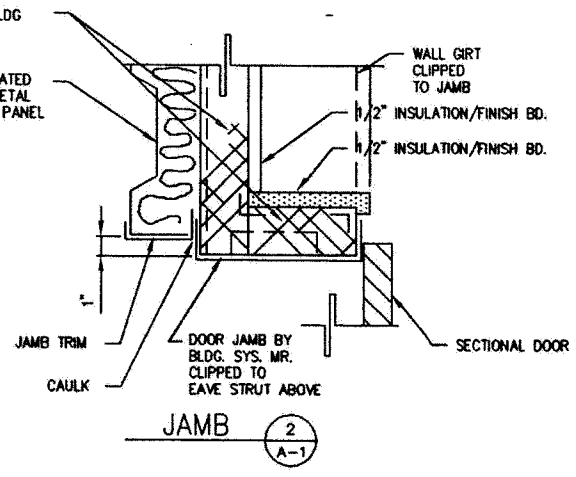
DRAWN: S DUSTIN	10/17/02	TASK ORDER NUMBER	2000-058
DESIGNED: S DUSTIN	10/17/02	SAFETY CATEGORY: CG	
CHECKED: G MECHAM	10/17/02	DRAWING NUMBER	REV 0
APPROVED:		10307	
CADD FILE: 10307_0.DWG			



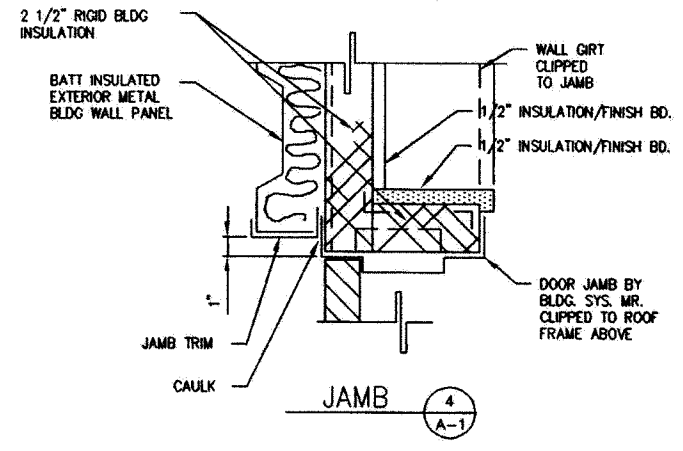
HEAD 1 / A-1



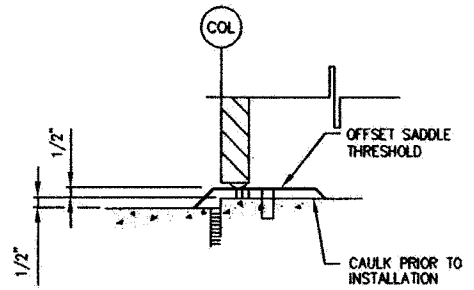
HEAD 3 / A-1



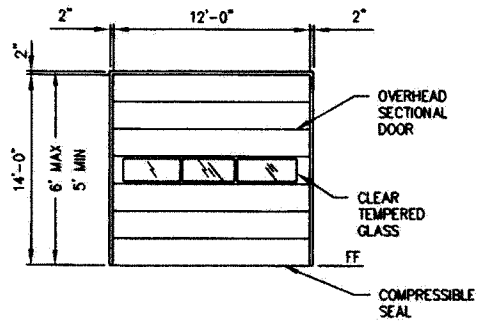
JAMB 2 / A-1



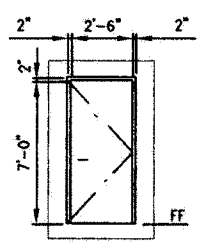
JAMB 4 / A-1



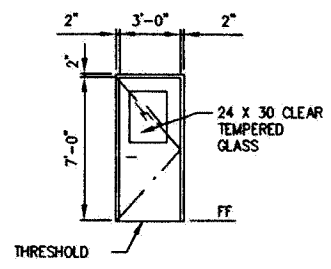
SILL 5 / A-1



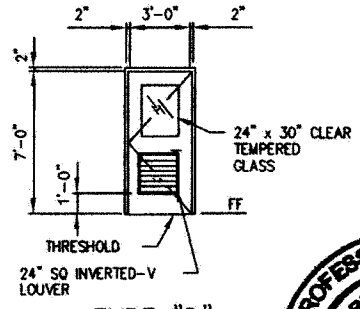
TYPE "A"



TYPE "B"



TYPE "C"



TYPE "D"

REV	DATE	DESCRIPTION	BY	LEAD ENGR	ACPT MGR	PROJ MGR

NOTES

1) EXTERIOR DOOR FRAMES TO BE PROVIDED BY BUILDING SYSTEM MANUFACTURER AND SHALL MATCH WALL GIRT DEPTH DIMENSION. EXTEND JAMB FRAMES TO ROOF FRAMING. CLIP WALL GIRTS AND HEAD FRAME TO JAMBS.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

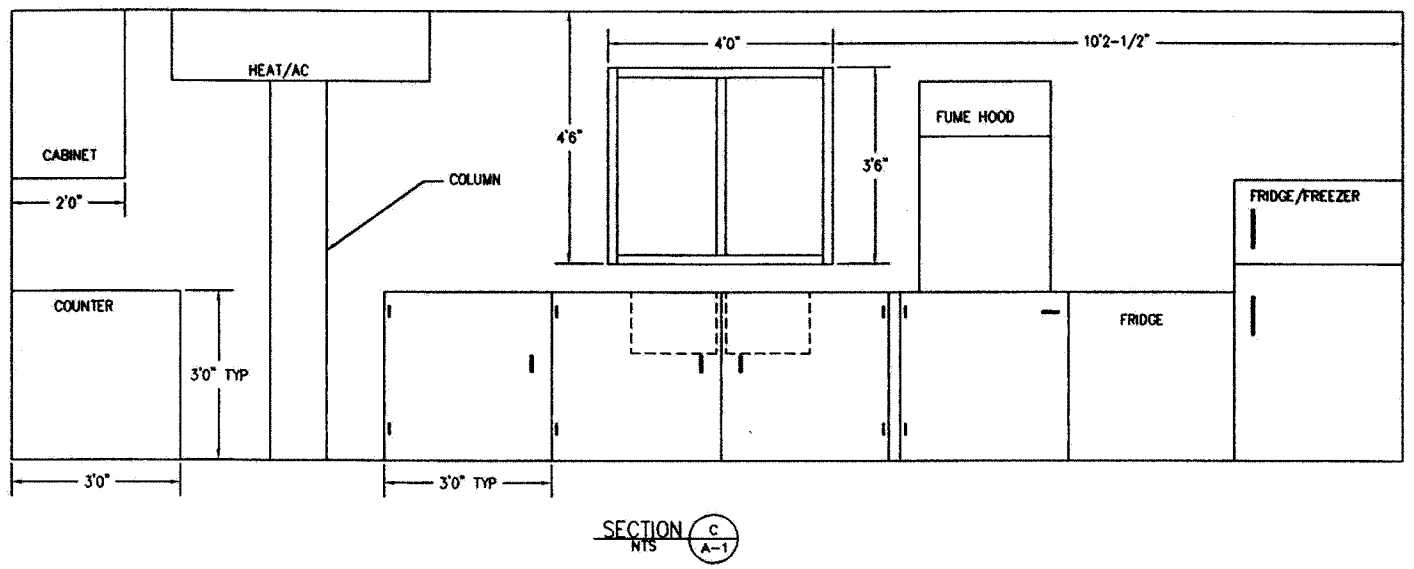
OU 1-07B ISB
DOOR DETAILS

INTREPID Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

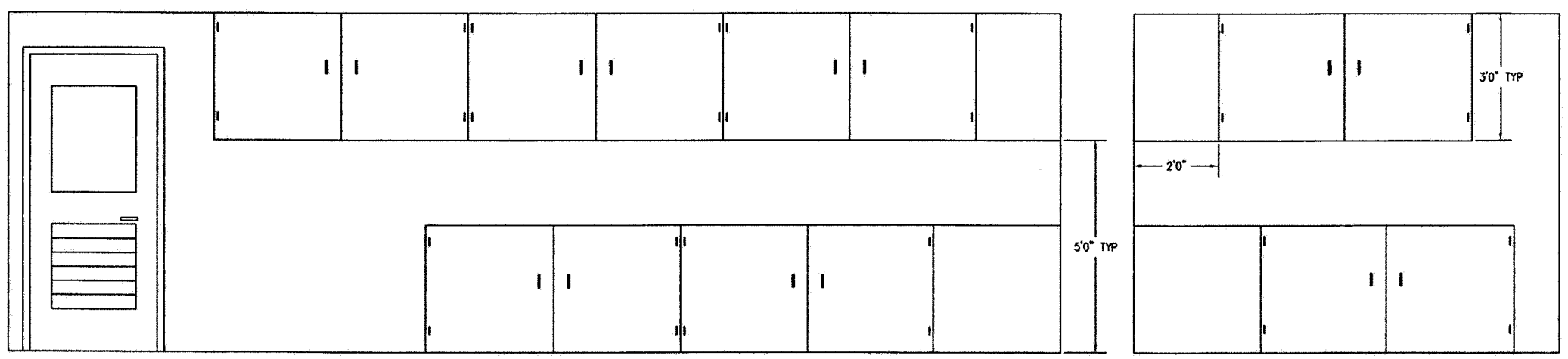
A-4

DRAWN: S. DUSTIN	10/17/02	TASK ORDER NUMBER 2000-058
DESIGNED: S. DUSTIN	10/17/02	
CHECKED: G. MECHAM	10/17/02	SAFETY CATEGORY: CG
APPROVED: .		DRAWING NUMBER 10308 REV 1
CADD FILE: 10308_0.DWG		

PROFESSIONAL ENGINEER REGISTERED 10712 STATE OF IDAHO J. SHAUN DUSTIN



SECTION C/A-1 NTS



SECTION D/A-1 NTS

SECTION E/A-1 NTS

PROFESSIONAL ENGINEER REGISTERED 10712 1/24/03 STATE OF IDAHO J. SHAUN DUSTIN

REV	DATE	DESCRIPTION	BY	ECO NO.	ECN NO.	PROJ NO.

NOTES

1) REFRIGERATOR AND FREEZER TO BE SUPPLIED BY OWNER

REFERENCE DRAWINGS

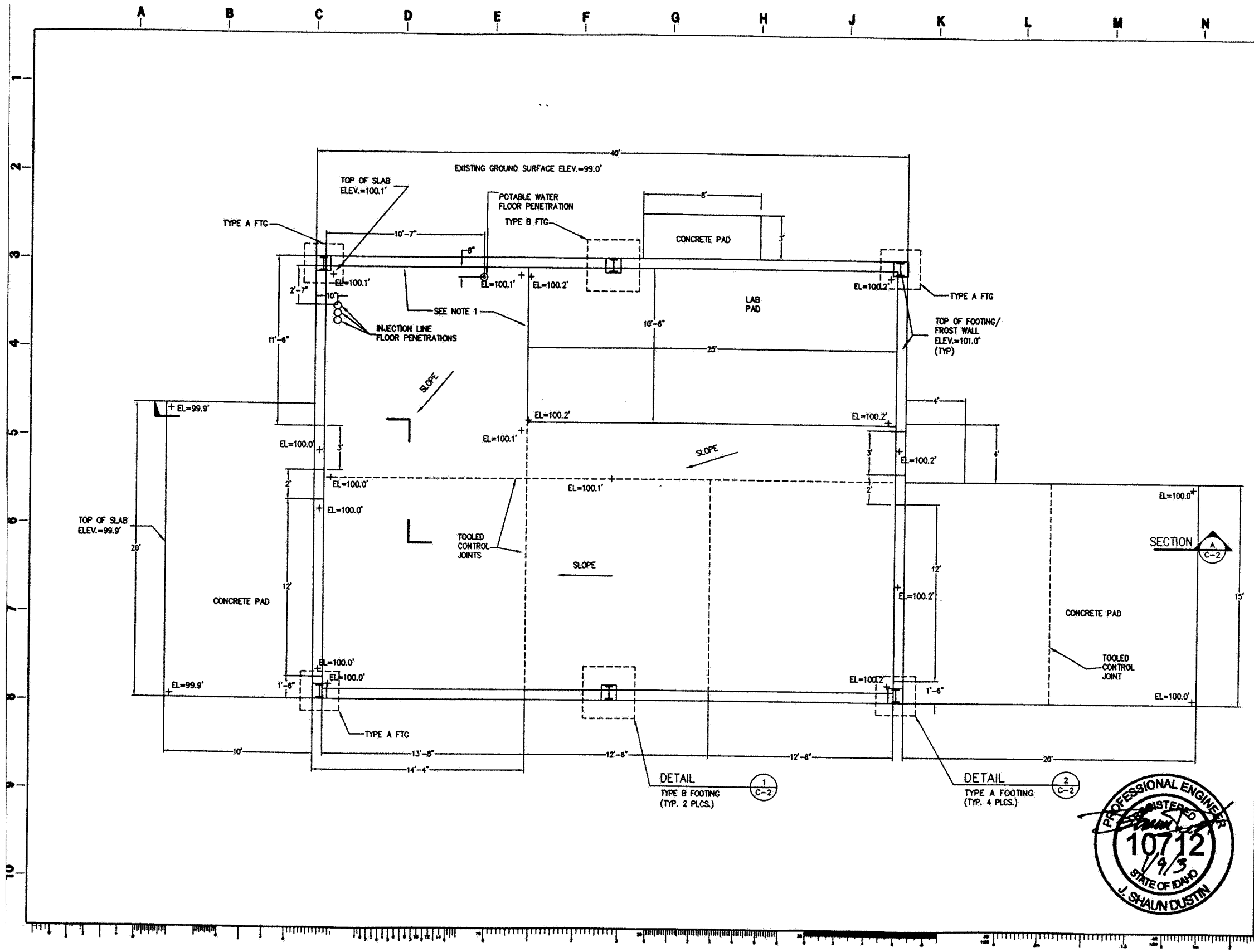
DRAWING NO.	DRAWING TITLE

OU 1-07B ISB
LABORATORY DETAILS

INTREPID Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

A-5

DRAWN: K MECHAM	10/17/02	TASK ORDER NUMBER 2000-058
DESIGNED: K KIMMELL	10/17/02	
CHECKED: G MECHAM	10/17/02	SAFETY CATEGORY: CO
APPROVED:		DRAWING NUMBER 10309 / REV 1
CADD FILE: 10309_1.DWG		



NOTES

1) PLACE FIBERBOARD EXPANSION JOINT BETWEEN ALL SLAB AND STEMWALL INTERFACES, AND BETWEEN LAB PAD AND STORAGE ROOM FLOOR.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

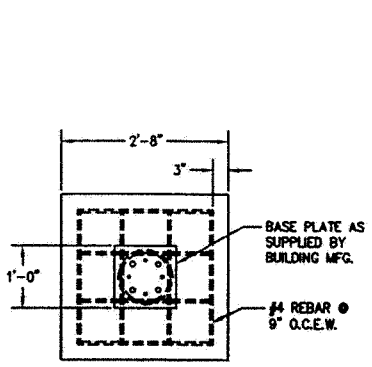
PROFESSIONAL ENGINEER REGISTERED 10712 9/3 STATE OF IDAHO J. SHAUN DUSTIN

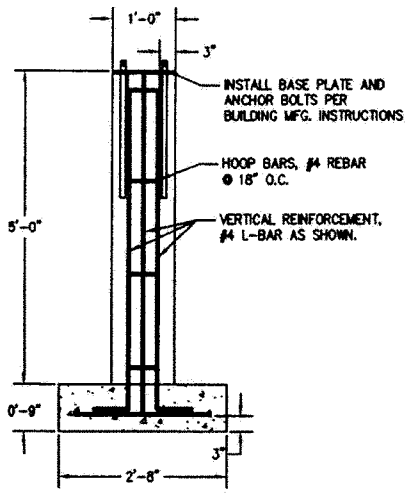
OU 1-07B ISB FLOOR SLAB

INTREPID Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

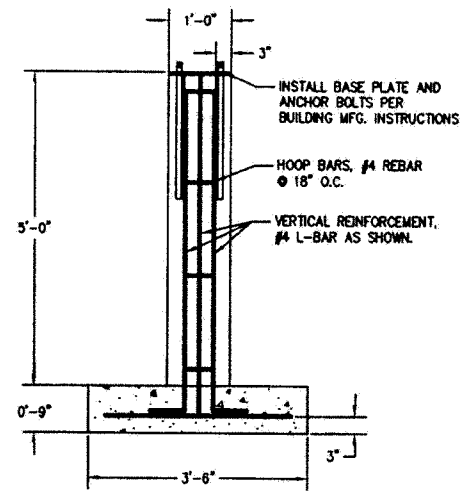
C-1

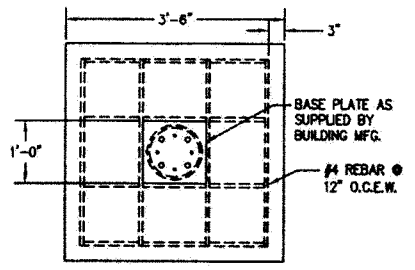
DRAWN: S DUSTIN	10/17/02	TASK ORDER NUMBER: 2000-058
DESIGNED: S DUSTIN	10/17/02	
CHECKED: G MEDHAN	10/17/02	SAFETY CATEGORY: 03
APPROVED:		DRAWING NUMBER: 10310 REV: 0
CADD FILE: 10310_0.DWG		



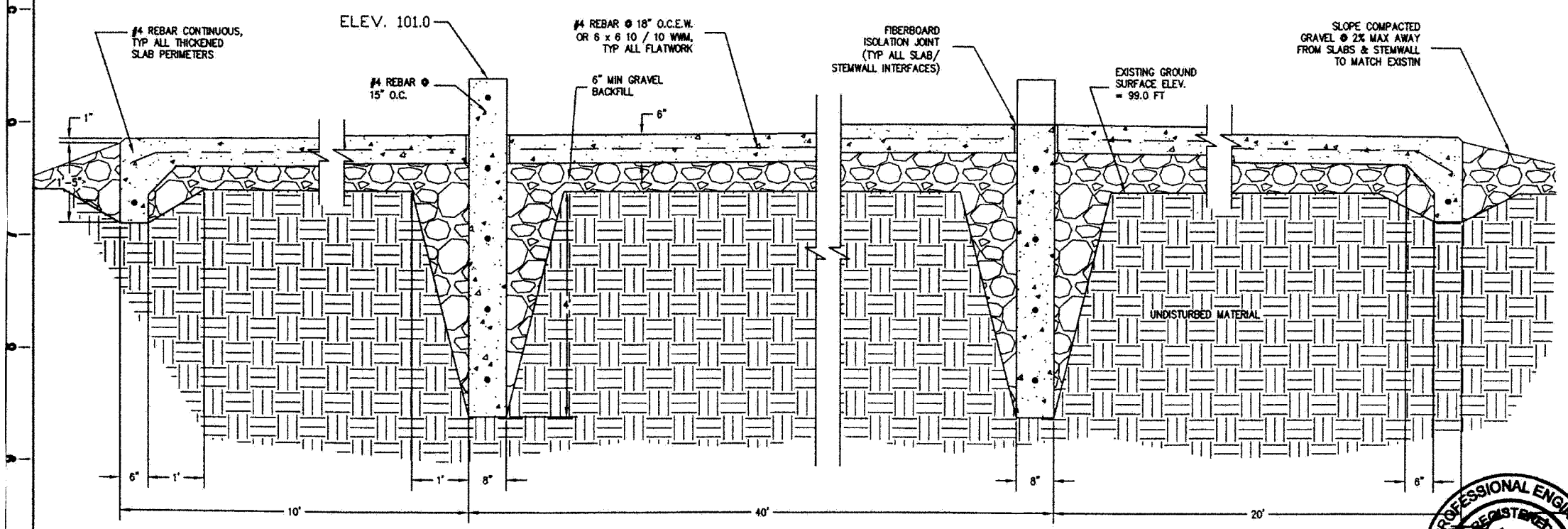


DETAIL 1 / C-1
TYPE B FOOTING
(TYP. 2 PLCS.)





DETAIL 2 / C-1
TYPE A FOOTING
(TYP. 4 PLCS.)



SECTION A / C-1
1" = 1'

NO.	DATE	DESCRIPTION	BY	USE WHERE	CHKD BY	APPD BY

NOTES

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

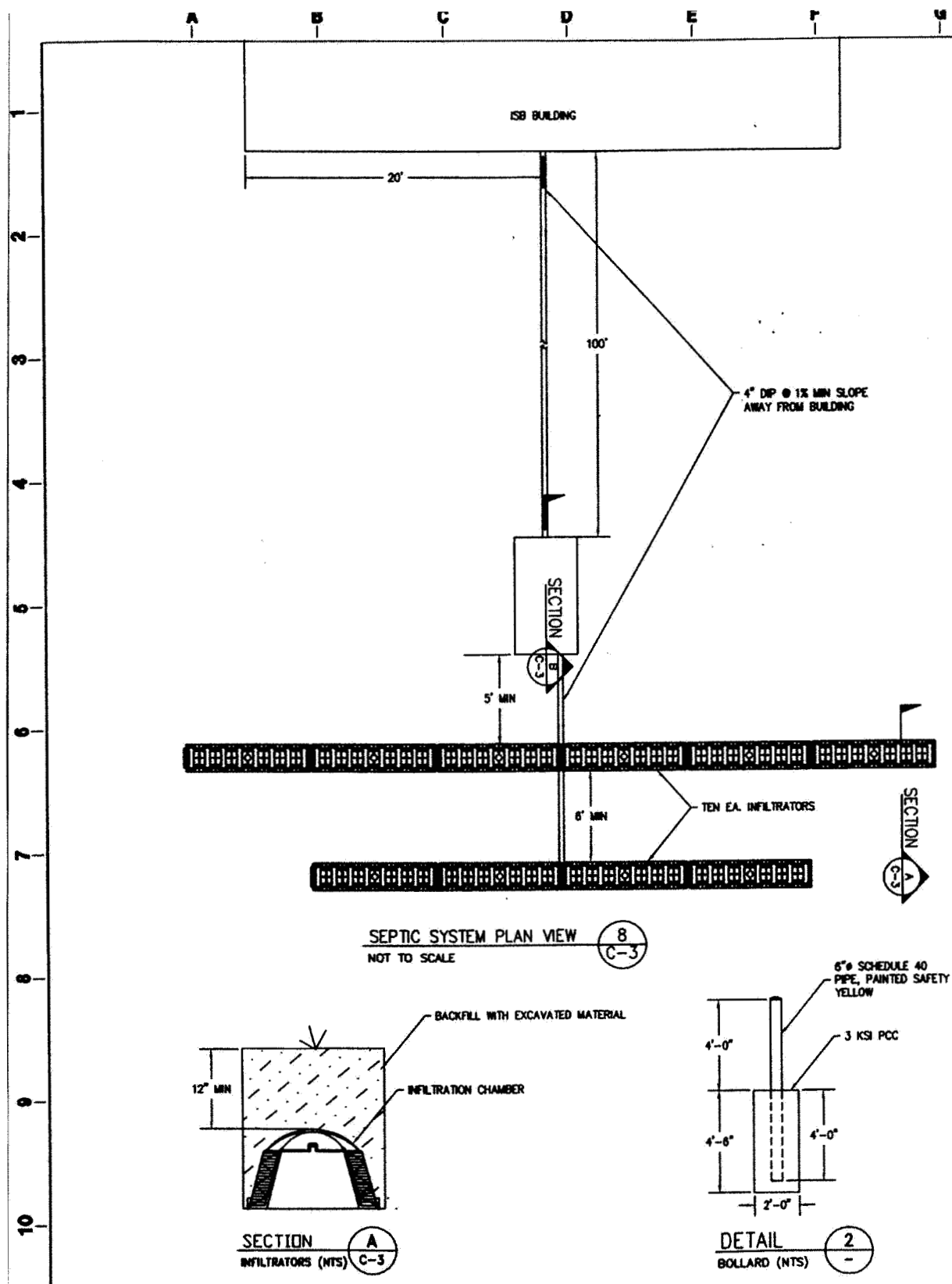
OU 1-07B ISB
FOUNDATION DETAILS

INTREPID
Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

C-2

DRAWN: S DUSTIN	10/17/02	TASK ORDER NUMBER	2000-058
DESIGNED: S DUSTIN	10/17/02		
CHECKED: G MECHAM	10/17/02	SAFETY CATEGORY:	CG
APPROVED:		DRAWING NUMBER	10311
CADD FILE: 10311_0.DWG		REV	0

PROFESSIONAL ENGINEER REGISTERED 10712 9/6 STATE OF IDAHO J. SHALYN DUSTIN

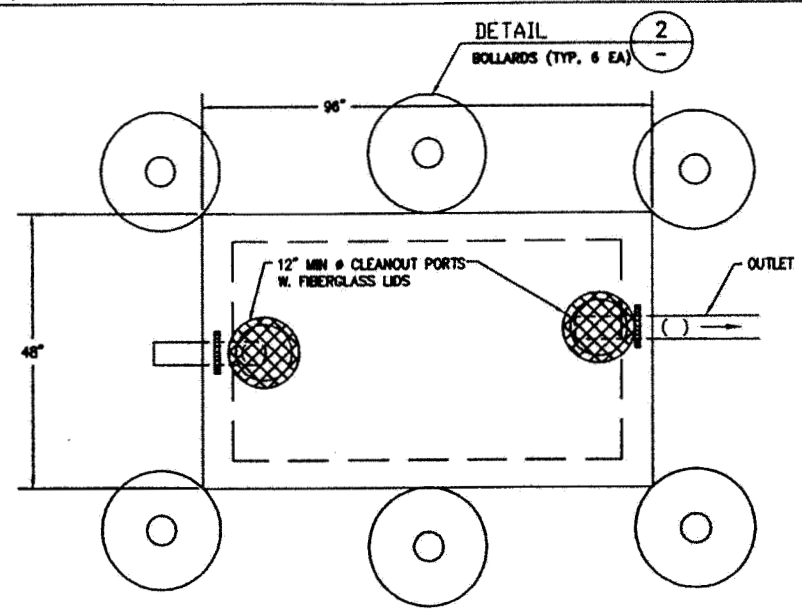


SEPTIC SYSTEM PLAN VIEW (8 / C-3)
NOT TO SCALE

SECTION (A / C-3)
INFILTRATORS (NTS)

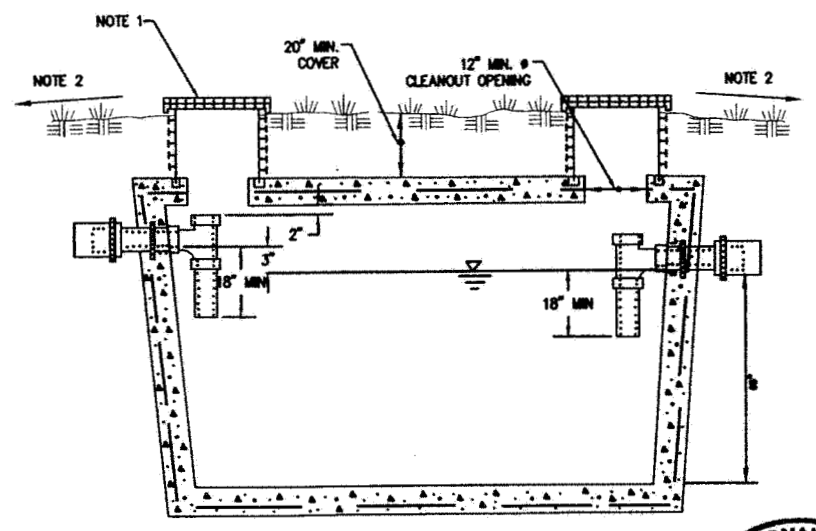
DETAIL (2 / -)
BOLLARD (NTS)

DETAIL (2 / -)
BOLLARDS (TYP, 6 EA)



SECTION (C / -)
NOT TO SCALE

C SECTION (C / C-3)



SECTION (B / -)
SEPTIC TANK (NTS)

NOTES

1) SUPPLY 1000 GAL MIN CAPACITY SEPTIC TANK AS REQUIRED IN THE SPECIFICATIONS.

2) SLOPE GROUND TO PROVIDE POSITIVE DRAINAGE AWAY FROM RISERS.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

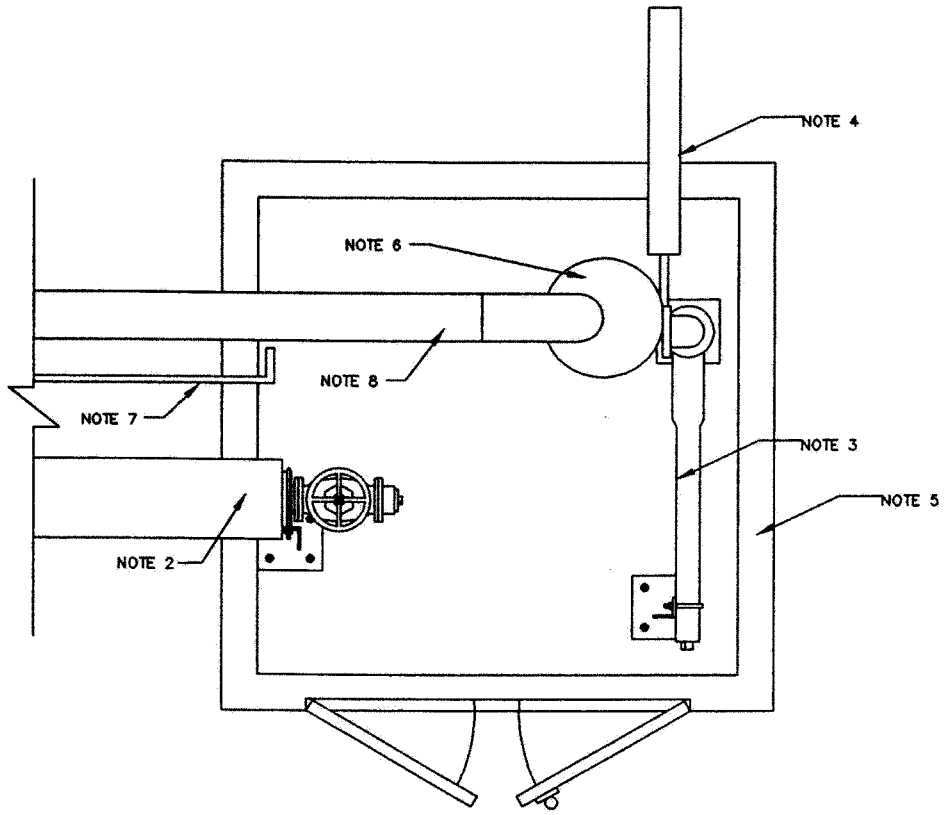
OU 1-07B ISB
SEPTIC SYSTEM

INTREPID
Engineering Services
301 N. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

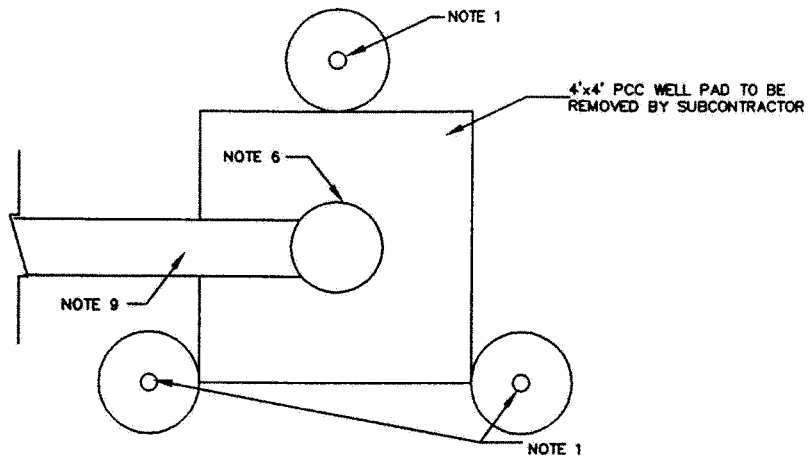
C-3

DRAWN: S DUSTIN	10/17/02	TASK ORDER NUMBER 2000-058
DESIGNED: S DUSTIN	10/17/02	
CHECKED: G MCNAY	10/17/02	SAFETY CATEGORY: CC
APPROVED:		DRAWING NUMBER 10312 REV 0
CADD FILE: 10312_0.DWG		

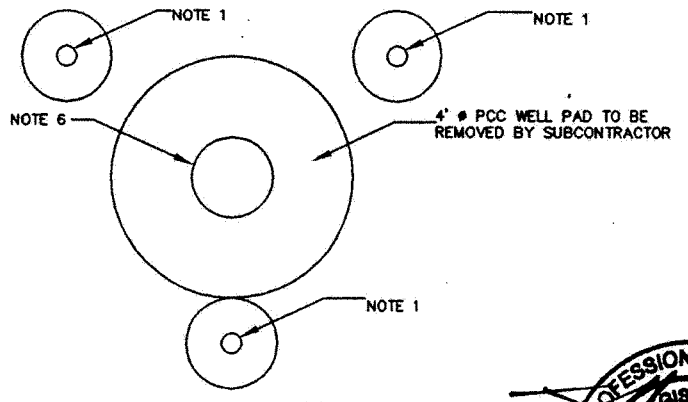
PROFESSIONAL ENGINEER REGISTERED 10712 STATE OF IDAHO J. SHAUN DUSTIN



DETAIL 2
TSF-05 DEMOLITION G-5
1"=10"



DETAIL 1
TAN-31 DEMOLITION G-5
NTS



DETAIL 3
TAN-37 DEMOLITION G-5
NTS

NOTES

1) REMOVE BOLLARDS AND CONCRETE BASES

2) 6" CS PIPE SLEEVE AND 2" CS PIPE TO BE REMOVED BY SUBCONTRACTOR. INCLUDES VALVE, PIPE SUPPORT, AND 4 LF PIPE, PIPE SLEEVE, AND INSULLATION.

3) APPROX. 7 LF OF 2" AND 3" SS PIPE AND 2 EA. PIPE SUPPORTS TO BE REMOVED BY SUBCONTRACTOR

4) APPROX. 5 LF OF 1" AND 3" CS PIPE TO BE REMOVED BY SUBCONTRACTOR

5) EXISTING 5'9"x5'9" LIGHT GAUGE STEEL FRAMED SHELTER TO BE REMOVED BY SUBCONTRACTOR

6) RETAIN AND PROTECT WELLS AND CASINGS.

7) RETAIN AND PROTECT EXISTING ELECTRICAL FEED TO TSF-05.

8) RETAIN AND PROTECT INJECTION LINE TO TSF-05

9) REMOVE INJECTION LINE, INJECTION LINE PIPE SLEEVE, AND INSULLATION (SHEET G-5). WELD PATCH ON CASING TO SEAL CASING SIDEWALL.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

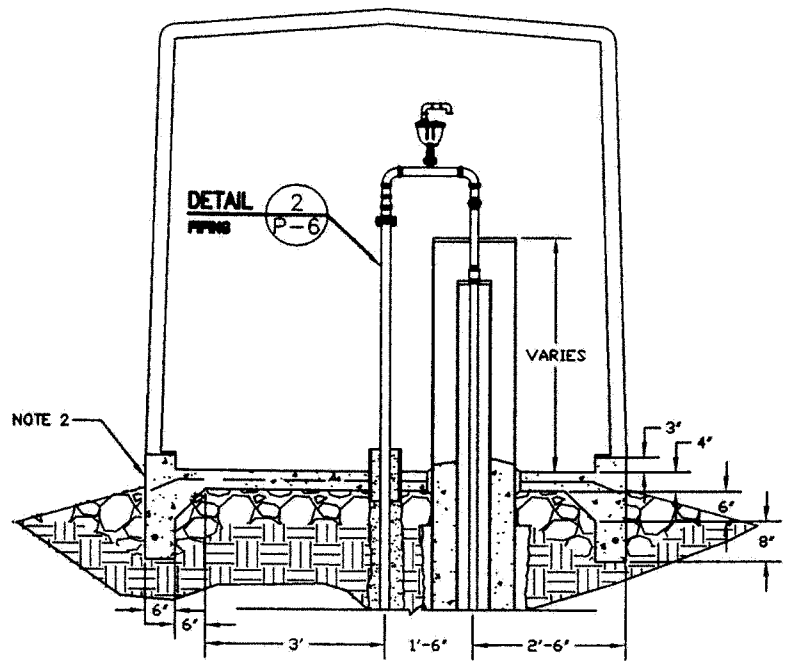
PROFESSIONAL ENGINEER REGISTERED 10712 1/9/03 STATE OF IDAHO J. SHAUN DUSTIN

OU 1-07B ISB
WELL SITEWORK
DEMOLITION

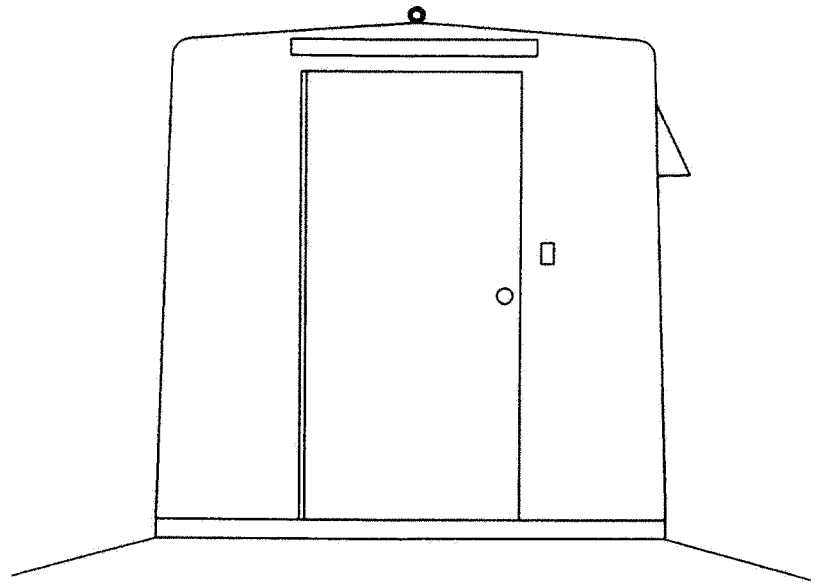
INTREPID
Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

C-4

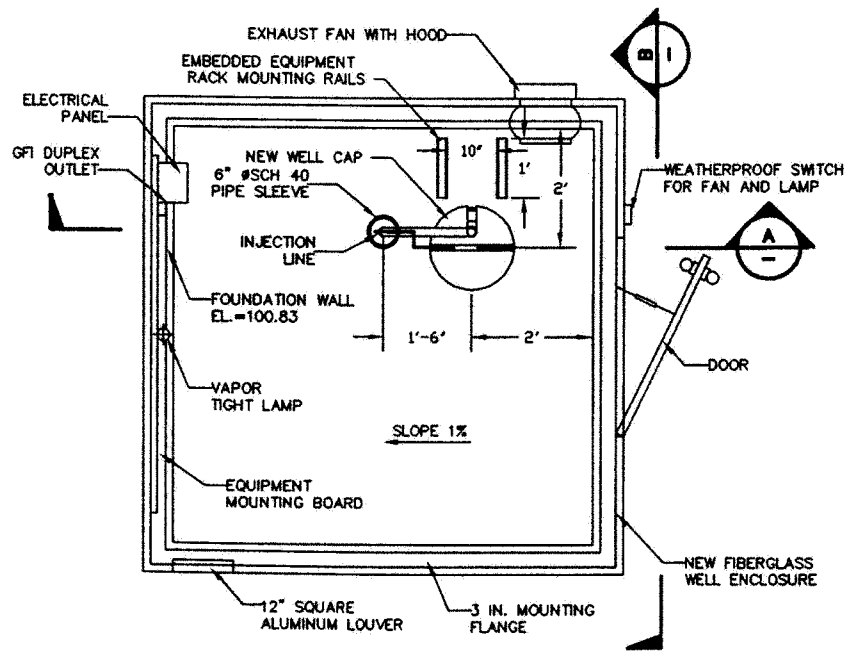
DRAWN: S DUSTIN	10/17/02	TASK ORDER NUMBER 2000-058
DESIGNED: S DUSTIN	10/17/02	
CHECKED: G MECHAM	10/07/02	SAFETY CATEGORY: CG
APPROVED:		DRAWING NUMBER 10313 REV 0
CADD FILE: 10313_0.DWG		



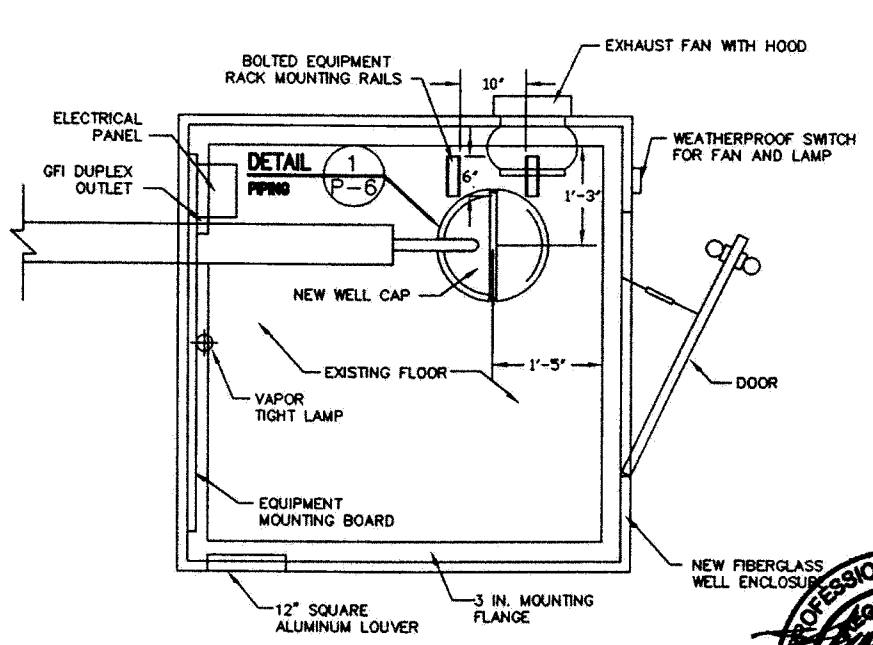
SECTION A
NEW WELLHOUSE FOUNDATION (TYP)
1"=16"



SECTION B
TYPICAL WELLHOUSE ELEVATION
NTS



DETAIL 1
NEW WELLHOUSE LAYOUT (TYP)
1"=16"
G-3



DETAIL 2
TSF-05 RECONSTRUCTION
1"=12"
G-3

NO.	DATE	DESCRIPTION	BY	USER NAME	USER NAME	PROJ MGR

NOTES

1) VALVES AND FITTINGS NOT SHOWN FOR CLARITY

2) PLACE NEW 8' x 8' RPCC PADS AS SHOWN FOR NEW INJECTION WELL AND EXISTING TAN-31 AND TAN-37. REINFORCE SLABS WITH #4 REBAR @ 12" OCEW CENTERED IN THE SLAB. SLOPE PAD 1% AWAY FROM DOOR.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

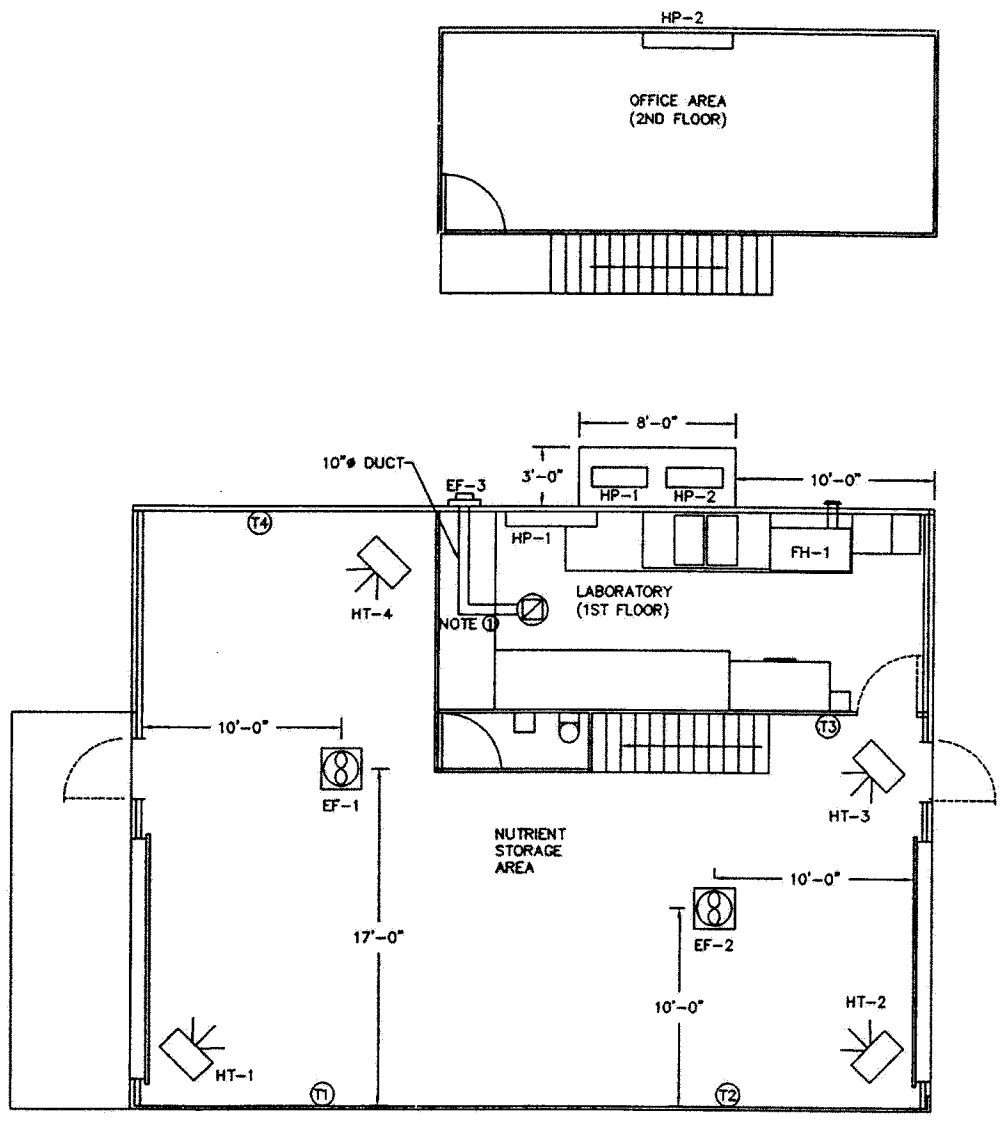
OU 1-07B ISB
WELL SHELTERS

INTREPID
Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

C-5

DRAWN: S. DUSTIN	10/17/02	TASK ORDER NUMBER: 2000-058
DESIGNED: S. DUSTIN	10/17/02	
CHECKED: Q. MECHAM	10/17/02	SAFETY CATEGORY: CS
APPROVED:		DRAWING NUMBER: 10314 REV: 0
CADD FILE: 10314_0.DWG		

PROFESSIONAL ENGINEER REGISTERED 10712 1/9/3 STATE OF IDAHO J. SHALAN DUSTIN



NO.	DATE	DESCRIPTION	BY	CHKD	APPD

NOTES

1) RUN DUCT IN SPACE BETWEEN 1ST AND 2ND FLOOR. USE LAY IN CEILING REGISTER GRILL.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

PROFESSIONAL ENGINEER
REGISTERED
1/6/03
7065
STATE OF IDAHO
GARY D. MECHAM

OU 1-07B ISB
HVAC DIAGRAM

INTREPID
Engineering Services
301 N. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 Fax: (208)529-1014

M-1

DRAWN: K MECHAM	10/17/02	TASK ORDER NUMBER	2000-058
DESIGNED: G MECHAM	10/17/02	SAFETY CATEGORY:	CC
CHECKED: G MECHAM	10/17/02	DRAWING NUMBER	10315
APPROVED: .	.	REV	0
CADD FILE: 10315_0.DWG			

UNIT HEATER SCHEDULE

UNIT NO.	LOCATION	TYPE	CFM	HEATER				MOTOR			OPER WT (LBS)	MANUFACTURER MODEL NO.	REMARKS
				CAPACITY KW	CAPACITY MBH	VOLTS/ PH/HZ	AMPS	HP	VOLTS/ PH/HZ	RPM			
HT-1	NUTRIENT STORAGE AREA	ELECTRIC	530	5	17	480/3/60	6.5	1/40	208/1/60	1550	52	MODINE HER-50	W/WALL MOUNTING BRACKET AND REMOTE THERMOSTAT
HT-2	NUTRIENT STORAGE AREA	ELECTRIC	530	5	17	480/3/60	6.5	1/40	208/1/60	1550	52	MODINE HER-50	W/WALL MOUNTING BRACKET AND REMOTE THERMOSTAT
HT-3	NUTRIENT STORAGE AREA	ELECTRIC	530	5	17	480/3/60	6.5	1/40	208/1/60	1550	52	MODINE HER-50	W/WALL MOUNTING BRACKET AND REMOTE THERMOSTAT
HT-4	NUTRIENT STORAGE AREA	ELECTRIC	530	5	17	480/3/60	6.5	1/40	208/1/60	1550	52	MODINE HER-50	W/WALL MOUNTING BRACKET AND REMOTE THERMOSTAT

FAN SCHEDULE

UNIT NO.	LOCATION	TYPE	FAN					MOTOR			OPER WT (LBS)	MANUFACTURER MODEL NO.	REMARKS
			CFM	SP (IN WC)	RPM	DRIVE	BHP	HP	VOLTS/ PH/HZ	RPM			
EF-1	NUTRIENT STORAGE AREA	CENTRIFUGAL ROOF	928	0.2	1550	DIRECT	0.09	1/8	115/60/1	1550	38	GREENHECK LD-95-D	WITH DAMPER, BIRD SCREEN, AND ROOF CURB
	NUTRIENT STORAGE AREA	CENTRIFUGAL ROOF	928	0.2	1550	DIRECT	0.09	1/8	115/60/1	1550	38	GREENHECK LD-95-D	WITH DAMPER, BIRD SCREEN, AND ROOF CURB
EF-3	LAB	CENTRIFUGAL SIDEWALL	480	0.5	1550	DIRECT	0.09	1/8	115/60/1	1550	40	GREENHECK CW-095-D	WITH DAMPER AND BIRD SCREEN
FH-1	LAB	FUME HOOD	340	0.25				1/10	115/60/1			LABCONCO NO 28044-00 FISHER SCIENTIFIC CAT NO 16-301	WITH INCANDESCENT LIGHTING AND FIBERGLASS LINER

HEAT PUMP SCHEDULE

UNIT NO.	LOCATION	TYPE	FAN		COOLING			HEATING		VOLTS/ PH/HZ	OPER WT (LBS)	MANUFACTURER MODEL NO.	REMARKS
			CFM	NO OF SPEEDS	CAPACITY MBH	DESIGN TEMP	ALTITUDE	TYPE	CAPACITY MBH				
HP-1	LAB	WALL MOUNT EXTERNAL COMPRESSOR UNIT	710 530	2	24	95°F	4760	AIR TO AIR ELECTRIC (AUX)	25	208/1/60	OUTDOOR UNIT 202 INDOOR UNIT 57	MITSUBISHI ELECTRIC PKH24FK	DUAL UNIT SYSTEM WITH REMOTE WALL MOUNTED CONTROLLER
HP-2	LAB	WALL MOUNT EXTERNAL COMPRESSOR UNIT	710 530	2	18	95°F	4760	AIR TO AIR ELECTRIC (AUX)	18.6	208/1/60	OUTDOOR UNIT 131 INDOOR UNIT 57	MITSUBISHI ELECTRIC PKH18FK	DUAL UNIT SYSTEM WITH REMOTE WALL MOUNTED CONTROLLER

NOTES

1) EF-1, EF-2, AND EF-3 WILL USE A WALL MOUNTED MANUAL ON/OFF SWITCH LOCATED NEAR THE EXHAUST LOCATION

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

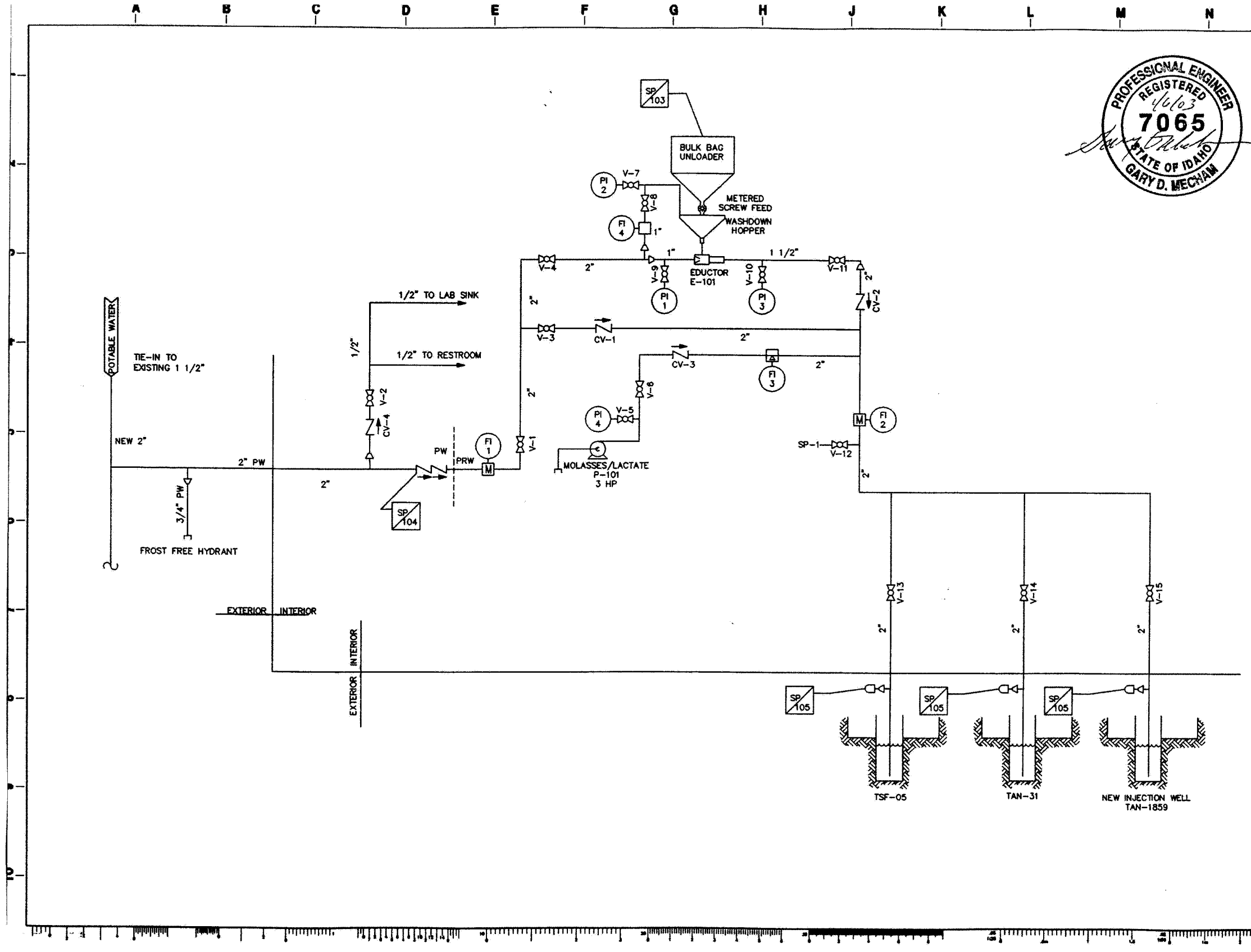
PROFESSIONAL ENGINEER REGISTERED 1/6/03 7065 STATE OF IDAHO GARY D. MECHAM

OU 1-07B ISB
HVAC SCHEDULES

INTREPID Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

M-2

DRAWN: K MECHAM	10/17/02	TASK ORDER NUMBER 2000-058
DESIGNED: G MECHAM	10/17/02	
CHECKED: G MECHAM	10/17/02	SAFETY CATEGORY: CG
APPROVED:		DRAWING NUMBER 10316 REV 0
CADD FILE: 10316_0.DWG		



PROFESSIONAL ENGINEER
REGISTERED
4/6/03
7065
STATE OF IDAHO
GARY D. MECHAM

NO.	DATE	DESCRIPTION	BY	CHECKED	APPROVED

NOTES

REFERENCE DRAWINGS

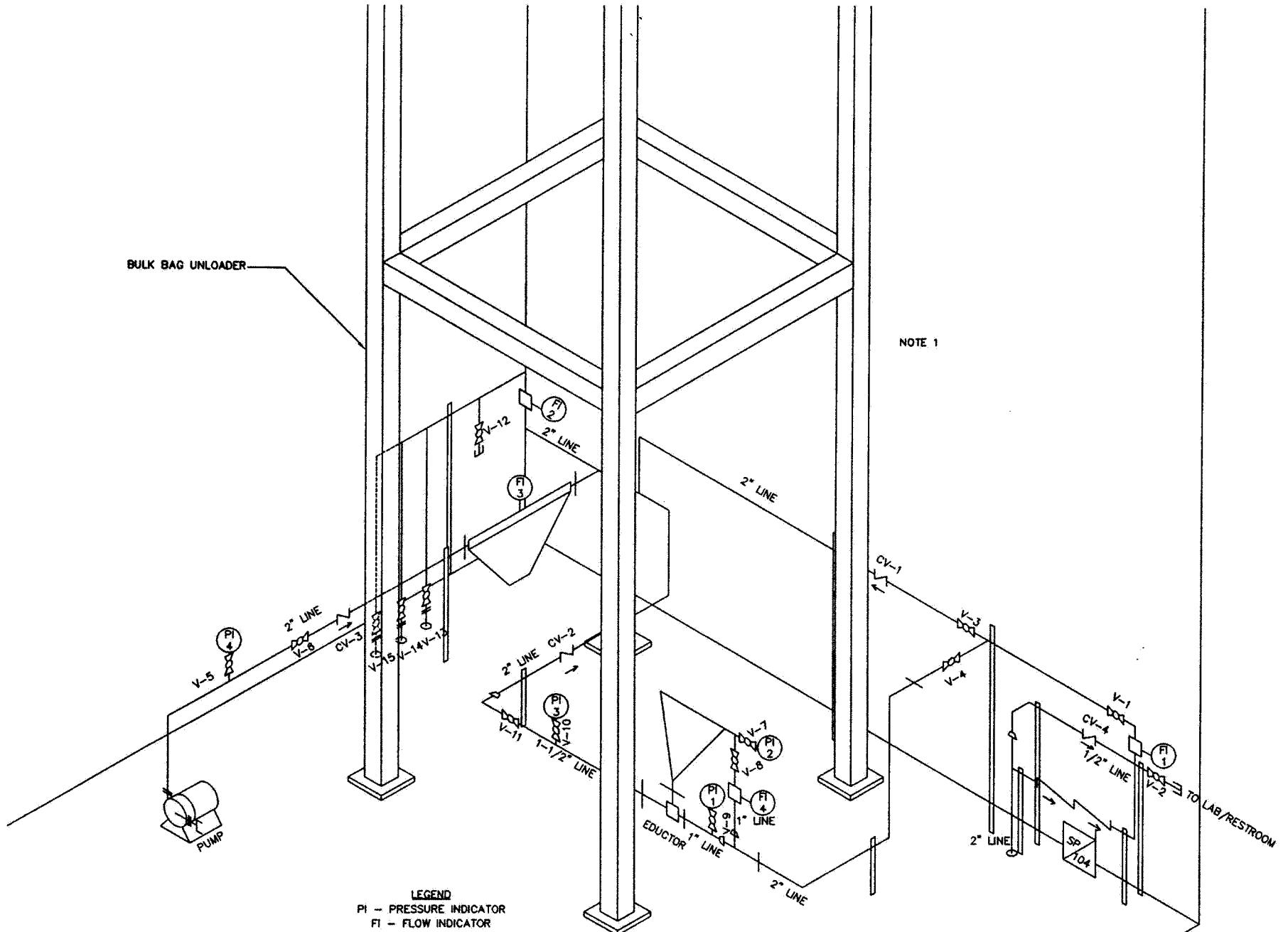
DRAWING NO.	DRAWING TITLE

OU 1-07B ISB PIPING AND INSTRUMENTATION DIAGRAM

INTREPID Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

P-1

DRAWN: K MECHAM	10/17/02	TASK ORDER NUMBER: 2000-058
DESIGNED: K KIMMELL	10/17/02	
CHECKED: G MECHAM	10/17/02	SAFETY CATEGORY: CO
APPROVED:		DRAWING NUMBER: 10317 REV: 0
CADD FILE: 10317_0.DWG		



NO	DATE	DESCRIPTION	BY	CHKD	APPD	ENGR APPD

NOTES

1) SEE DRAWING P-8 REGARDING DETAILS OF THE BULK BAG UNLOADER.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

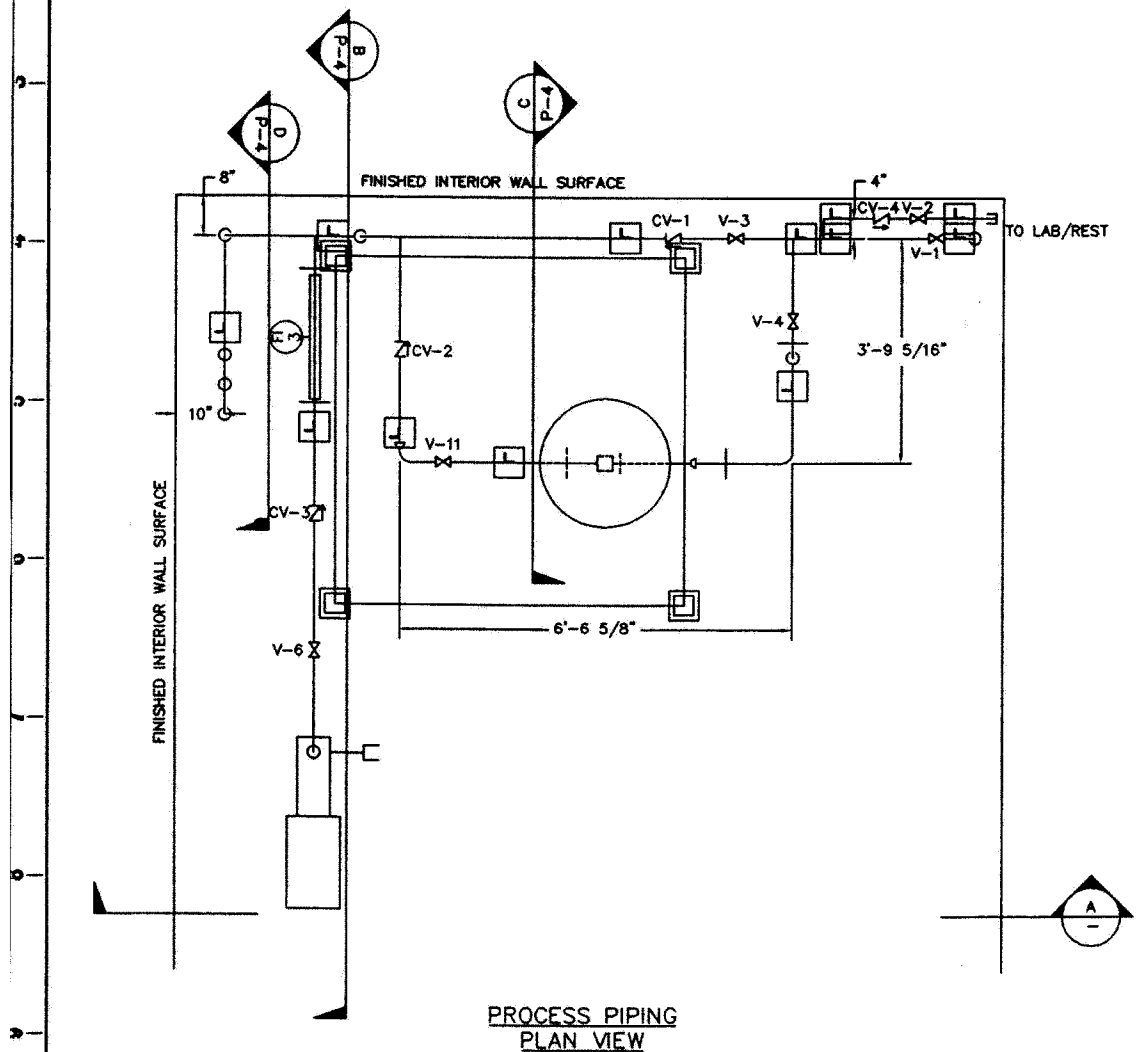
OU 1-07B ISB
BUILDING PIPING ARRANGEMENT, ISOMETRIC

PROFESSIONAL ENGINEER REGISTERED 6/6/03 7065 STATE OF IDAHO GARY D. MECHAM

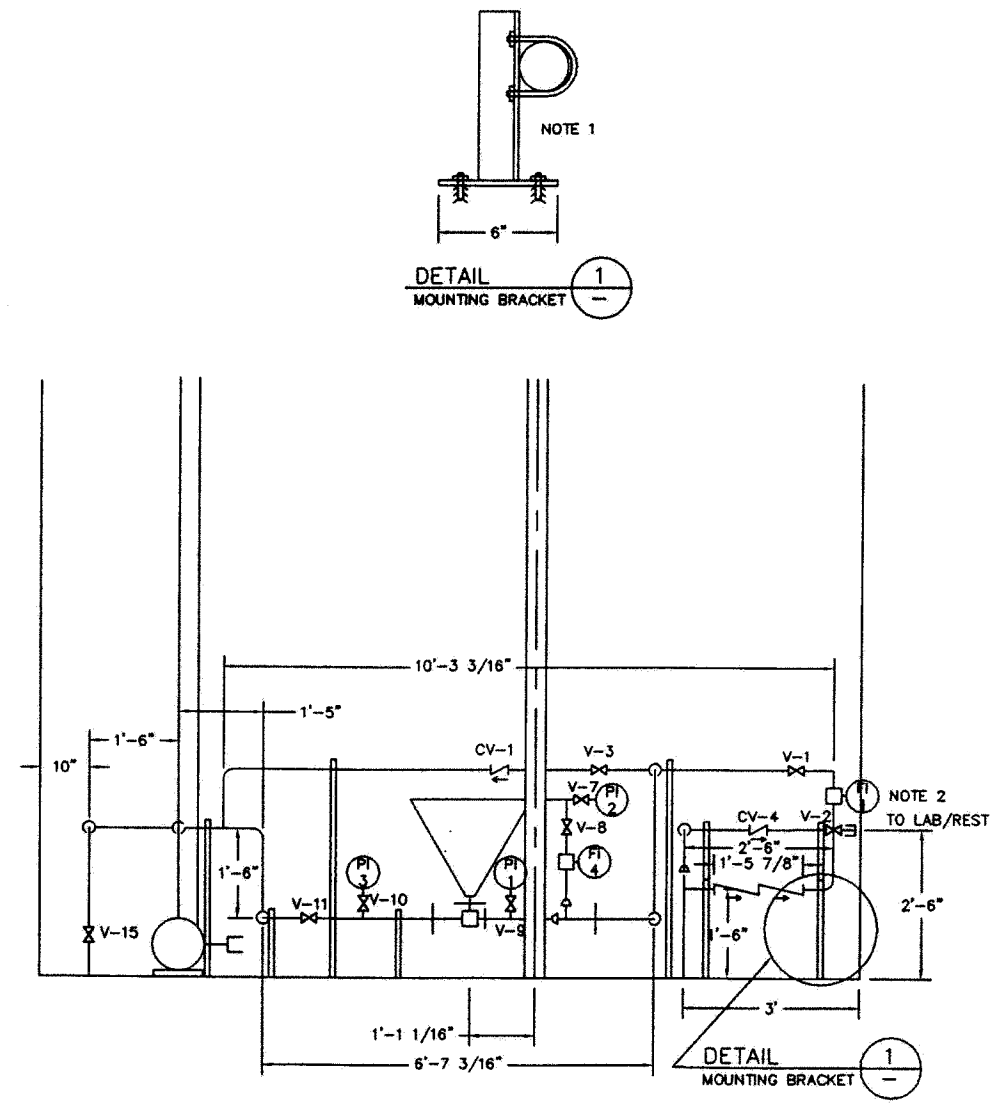
INTREPID Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)528-3337 fax: (208)528-1014

P-2

DRAWN: K MECHAM	10/17/02	TASK ORDER NUMBER	
DESIGNED: K KNAGLL	10/17/02	2000-058	
CHECKED: G MECHAM	10/17/02	SAFETY CATEGORY: CQ	
APPROVED:		DRAWING NUMBER	REV
CADD FILE: 10318_0.DWG		10318	0



PROCESS PIPING
PLAN VIEW



DETAIL
MOUNTING BRACKET (1)

SECTION (A)

DETAIL
MOUNTING BRACKET (1)

LEGEND
PI – PRESSURE INDICATOR
FI – FLOW INDICATOR

REV	DATE	DESCRIPTION	BY

NOTES

1) PIPE SUPPORTS WILL BE MADE WITH 1/4" x 2" ANGLE WITH 6"x6" BASE PLATES. ATTACH PIPE USING APPROPRIATE U-BOLTS.

2) PLUMBING TO BE ROUTED TO MEZANNINE FIXTURES BY MAZANNINE SUPPLIER.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

PROFESSIONAL ENGINEER
REGISTERED
1/4/03
7065
STATE OF IDAHO
GARY D. MECHAM

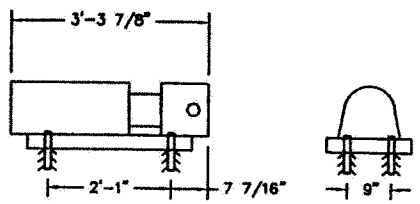
OU 1-07B ISB
PIPING DETAILS

INTREPID
Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

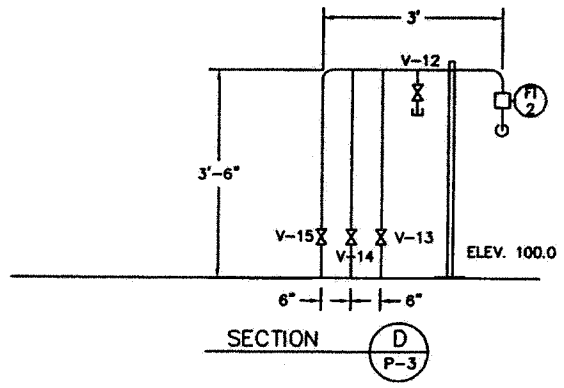
P-3

DRAWN: K MECHAM	10/17/02	TASK ORDER NUMBER: 2000-058
DESIGNED: K KIMMEL	10/17/02	
CHECKED: G MECHAM	10/17/02	SAFETY CATEGORY: CC
APPROVED: .	.	DRAWING NUMBER: 10319 REV: 0
CADD FILE: 10319_0.DWG		

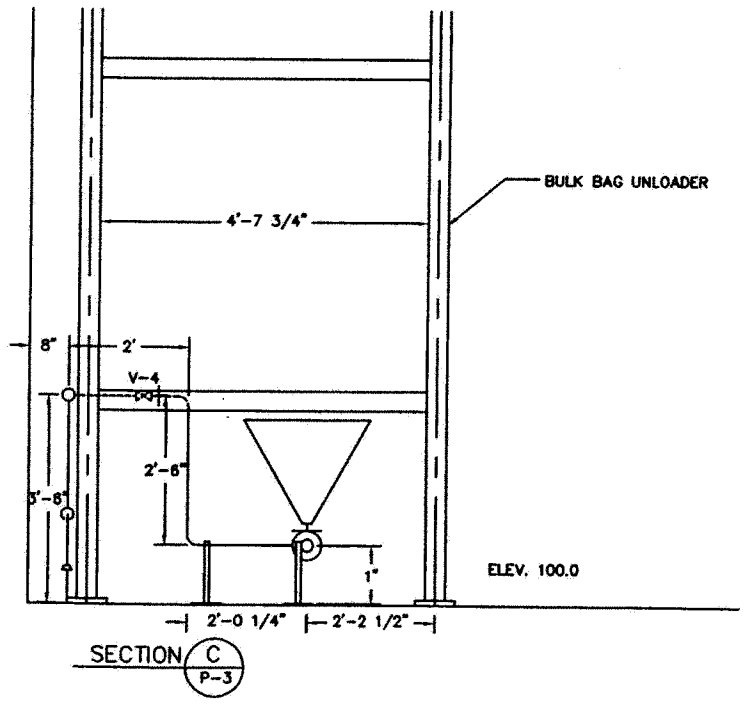
PUMP SCHEDULE													
UNIT NO.	SERVICE	TYPE	FLUID PUMPED	MAX FLUID TEMP	GPM @ FT HEAD	NPSH AVAIL. (FT)	INLET/OUTLET SIZE	MOTOR HP	VOLTS/ PH/HZ	TYPE	PUMP WT/ MOTOR WT	MANUFACTURER MODEL #	REMARKS
P-101	AMENDMENT INJECTION PUMP	INTERNAL GEAR	HIGH VISCOSITY FLUID	225°F	30 @ 40'	185'	1 1/2" 1 1/2" NPT	3	240/3/60	TEFC	40#/ 90#	PUMP-VIKING HL124AD MOTOR-213T	WITH MOUNTING BRACKET



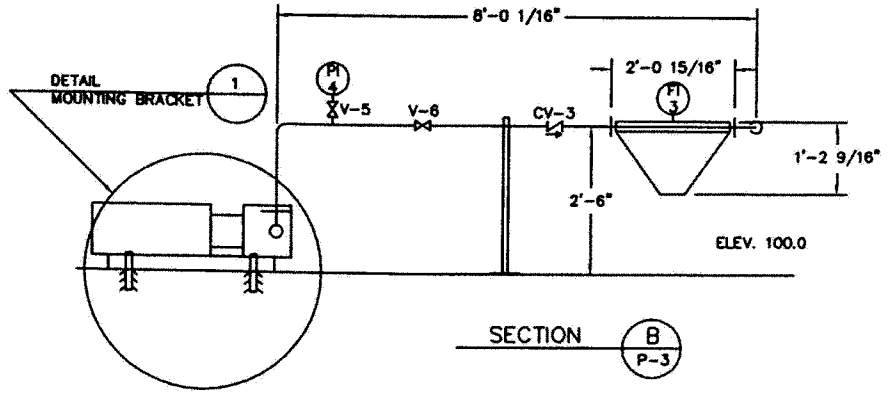
DETAIL MOUNTING BRACKET (1/-)



SECTION D P-3



SECTION C P-3



SECTION B P-3

NOTES

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

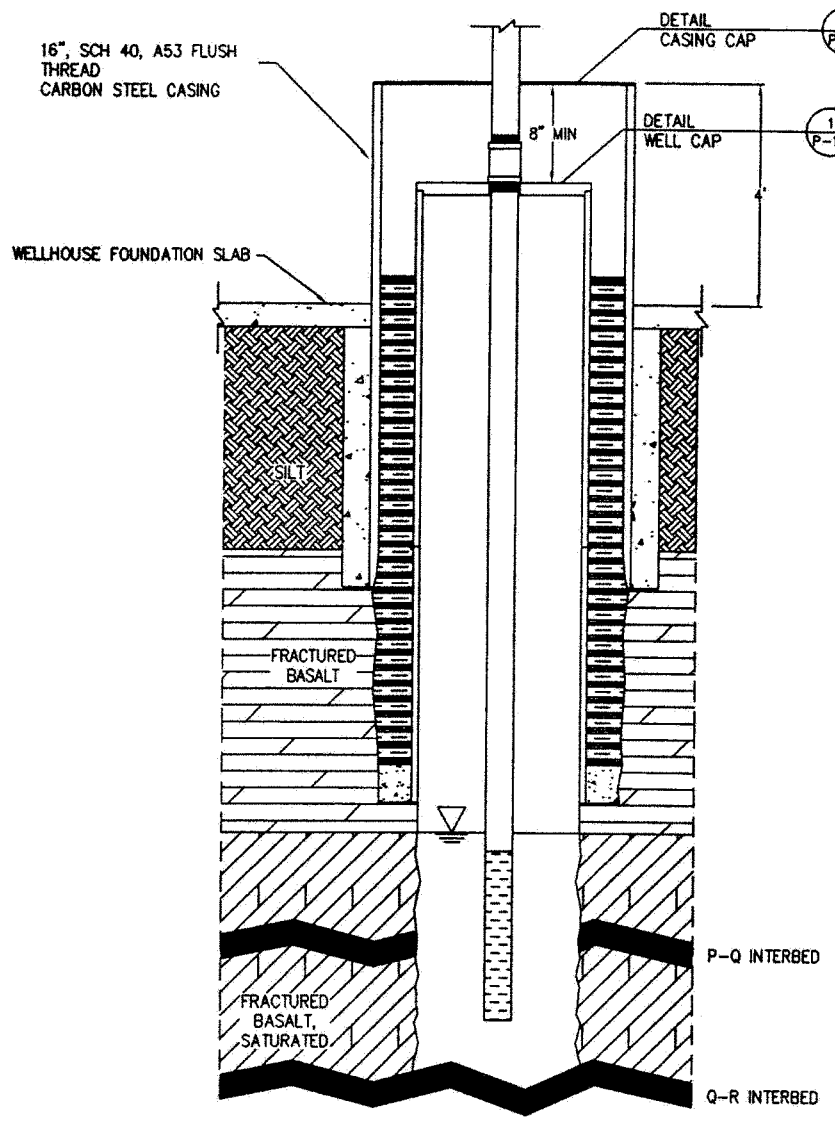
OU 1-07B ISB
PIPING SECTIONS

INTREPID Engineering Services
301 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)528-5337 fax: (208)528-1914

P-4

DRAWN: E MEDINA	10/17/02	TASK ORDER NUMBER	2000-058
DESIGNED: K KNEELL	10/17/02		
CHECKED: G MEDINA	10/17/02	SAFETY CLASSIFY:	CS
APPROVED:		DRAWING NUMBER	10320
CADD FILE: 10320_0.DWG		REV	0

PROFESSIONAL ENGINEER REGISTERED 1/6/03 7065 STATE OF IDAHO GARY D. [illegible]



INJECTION WELL PROFILE (TYP.)

DETAIL 4 / G-3
NOT TO SCALE

REV	DATE	DESCRIPTION	BY	USER ENGR	ENGR MGR	PROJ MGR

NOTES

1) WELL CONSTRUCTION WELL BE PERFORMED BY OTHERS. SUBCONTRACTOR WILL SUPPLY LOCKING WELL CAPS FOR INJECTION WELL.

2) INJECTION PIPING, WELL CAP, CASING CAP, AND FOUNDATION SLAB TO BE SUPPLIED AND INSTALLED BY SUBCONTRACTOR.

3) INJECTION PIPE TO EXTEND TO 275FT. BLS. USE SCREEN FROM 195FT TO 275FT BLS.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

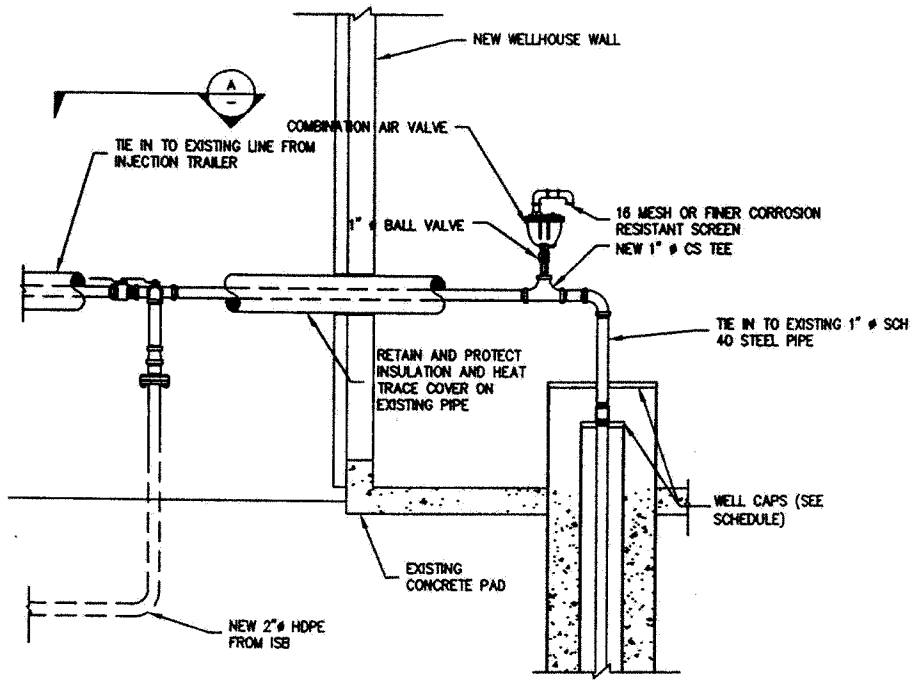
OU 1-07B ISB
NEW INJECTION WELL DETAIL

INTREPID
Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

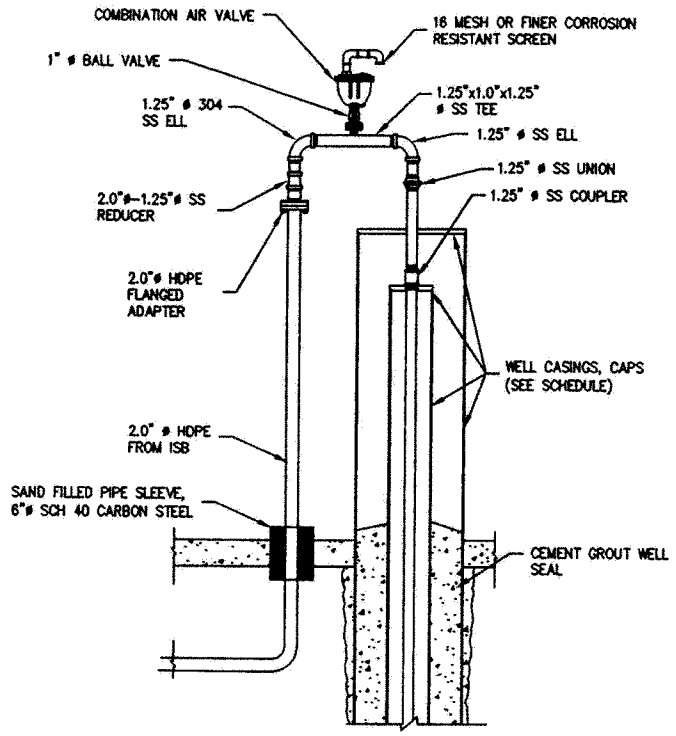
P-5

PROFESSIONAL ENGINEER REGISTERED Frank Poole 10712 1/9/3 STATE OF IDAHO J. SHAUN DUSTIN

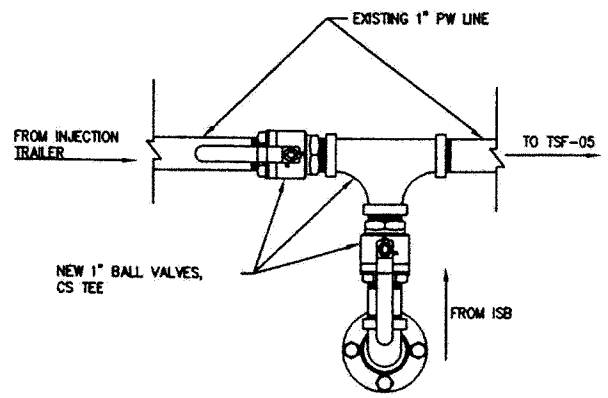
DRAWN: S DUSTIN	10/17/02	TASK ORDER NUMBER 2000-058
DESIGNED: S DUSTIN	10/17/02	SAFETY CATEGORY: CG
CHECKED: G MECHAM	10/17/02	DRAWING NUMBER 10321 REV 0
APPROVED:		
CADD FILE: 10321_0.DWG		



DETAIL 1 / — TSF-05 PIPING NTS



DETAIL 2 / — INJECTION WELL PIPING TAN-1859, TAN-31, TAN-37, NTS



SECTION A / — TSF-05 TIE-IN TO EXISTING NTS

WELL DETAIL SCHEDULE

WELL	WELL STATUS	WELL PAD STATUS	CASING DIAMETER		DETAILS				
			INTERNAL	EXTERNAL	GENERAL	INTERNAL WELL CAP	EXTERNAL WELL CAP	DEMOLITION	PIPING
TSF-05	EXISTING	EXISTING	6"	12"	2/C-5	1/P-10	2/P-11	2/C-4	1/P-6
TAN-31	EXISTING	NEW	6"	14"	1/C-5	1/P-10	2/P-11	1/C-4	2/P-6
TAN-37	EXISTING	NEW	6"	16"	1/C-5	1/P-10	2/P-11	3/C-4	2/P-6
TAN-1859	NEW	NEW	10"	16"	1/C-5	3/P-12	2/P-11	—	2/P-6

NO.	DATE	DESCRIPTION	BY	CHKD	APPD	PROJ APPD

NOTES

REFERENCE DRAWINGS

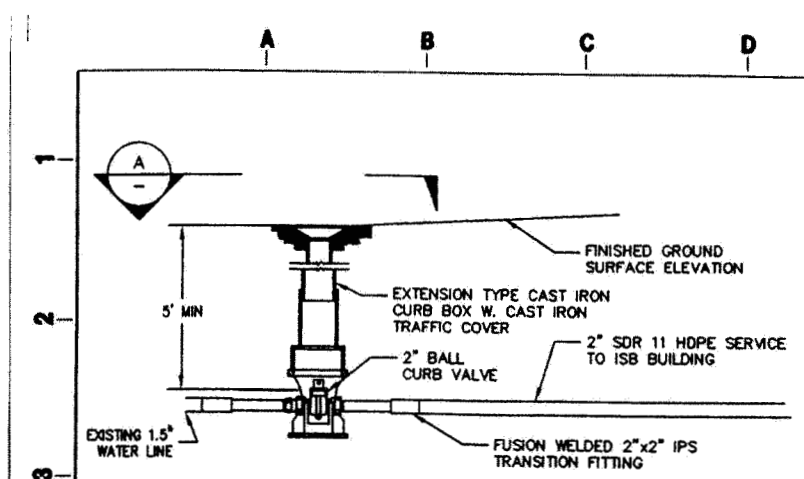
DRAWING NO.	DRAWING TITLE

OU 1-07B ISB
WELLHEAD DETAILS
WELL DETAIL SCHEDULE

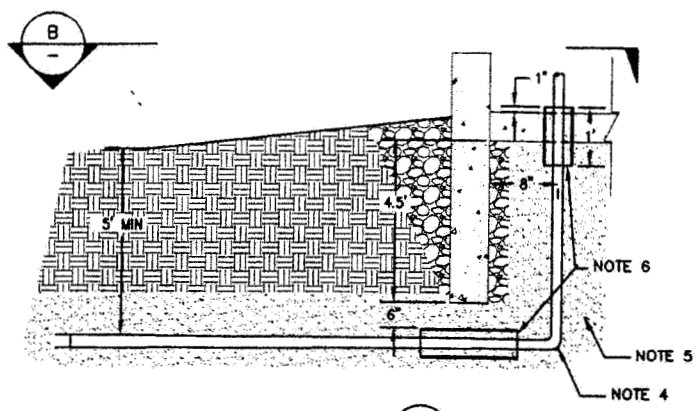
INTREPID Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1914

P-6

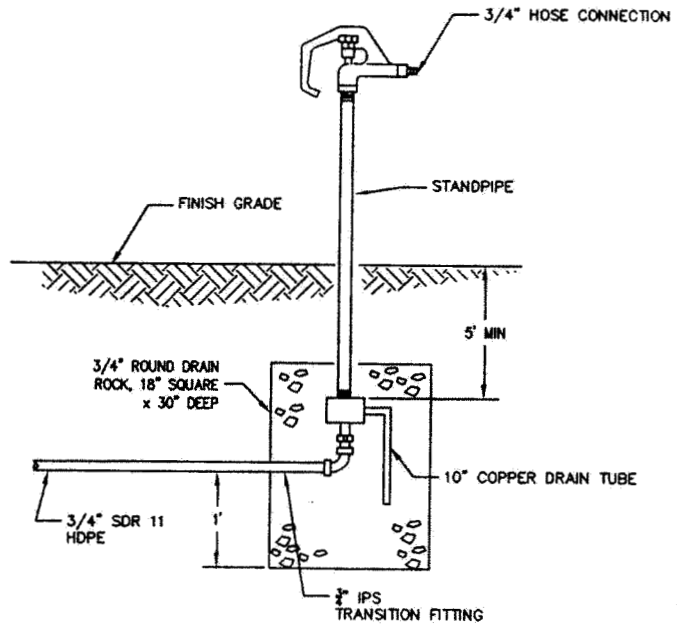
DRAWN: S DUSTIN	10/17/02	TASK ORDER NUMBER 2000-058
DESIGNED: S DUSTIN	10/17/02	
CHECKED: G MECHAM	10/17/02	SAFETY CATEGORY: C2
APPROVED:		DRAWING NUMBER 10322 REV 0
CADD FILE: 10322_0.DWG		



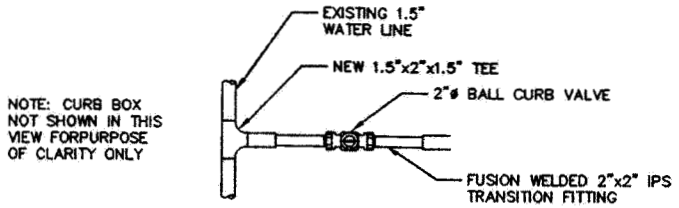
DETAIL 5 G-3
TIE IN TO EXISTING WATER LINE, NTS



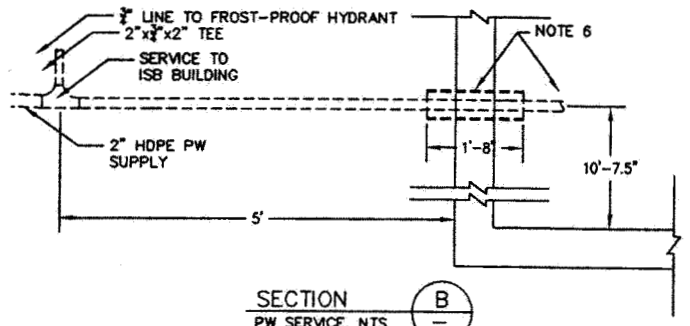
DETAIL 6 G-3
POTABLE WATER SERVICE, NTS



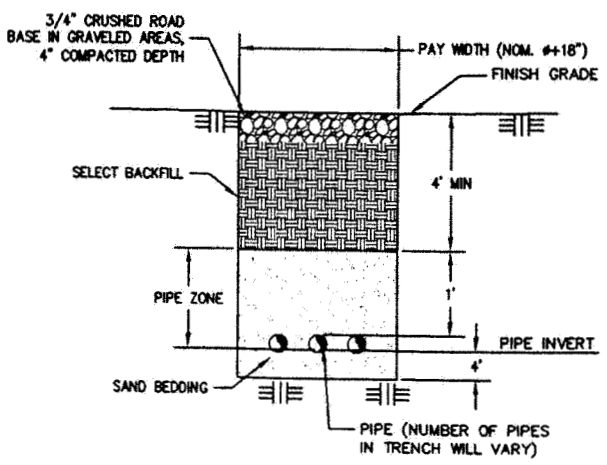
DETAIL 7 G-3
NEW FROSTPROOF HYDRANT, NTS



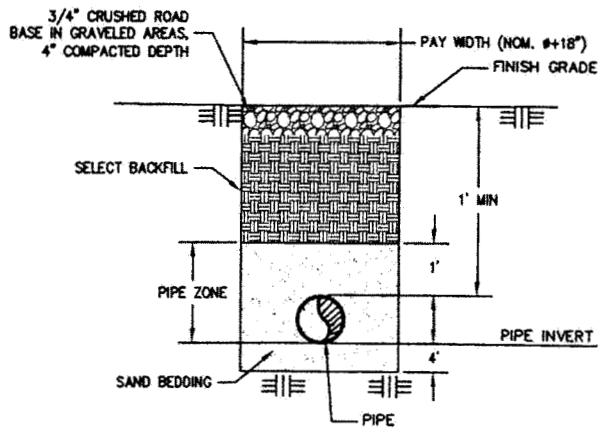
SECTION A —
PW TIE IN, NTS



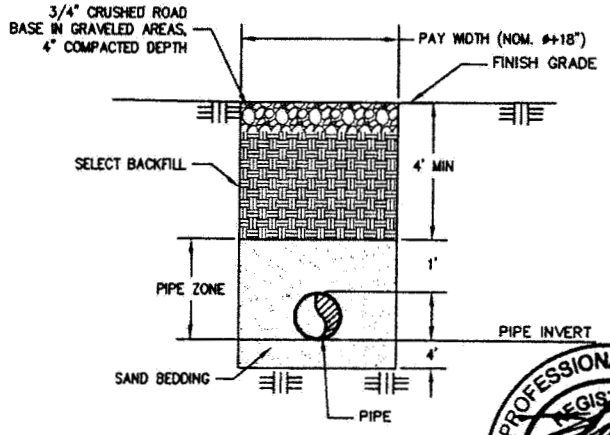
SECTION B —
PW SERVICE, NTS



SECTION A G-3
INJECTION LINE TRENCH, NTS



SECTION B G-3
WASTEWATER PIPE TRENCH, NTS



SECTION C G-3
WATER PIPE TRENCH, NTS

NOTES

1) STEP TRENCHES AS REQUIRED TO COMPLY WITH OSHA REQUIREMENTS.

2) MAINTAIN 6" MIN SPACING BETWEEN ADJACENT PIPE CENTERLINES AND BETWEEN PIPE CENTERLINES TRENCH WALLS.

3) PAY WIDTH IS 6" + 6" FOR EACH PIPE IN TRENCH (18" MIN. OR MIN. AS REQUIRED TO COMPLY WITH OSHA GUIDELINES).

4) ALL BURIED PIPE AND FITTINGS TO BE CONTINUOUSLY HEAT FUSION WELDED HDPE UNLESS SPECIFICALLY NOTED OTHERWISE IN THE DRAWINGS.

5) PROVIDE 15"ø COMPACTED SAND BACKFILL AROUND BURIED VERTICAL PIPE RUNS.

6) 6"ø SCHEDULE 40 STEEL PIPE SLEEVE CAST INTO FLOOR SLAB OR PLACED UNDER FOOTING AS INDICATED IN THE DRAWING. SMOOTH AND DEBURR ALL EDGES. FILL SLEEVE WITH COMPACTED SAND TO FLOOR ELEVATION. TYPICAL 1 SLAB PENETRATIONS AND ONE SLEEVE UNDER FOUNDATION FOR EACH INJECTION LINE, ONE SLAB PENETRATION AND ONE SLEEVE UNDER FOOTING FOR POTABLE WATER SERVICE, AND ONE SLEEVE THROUGH FOOTING FOR WASTEWATER.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

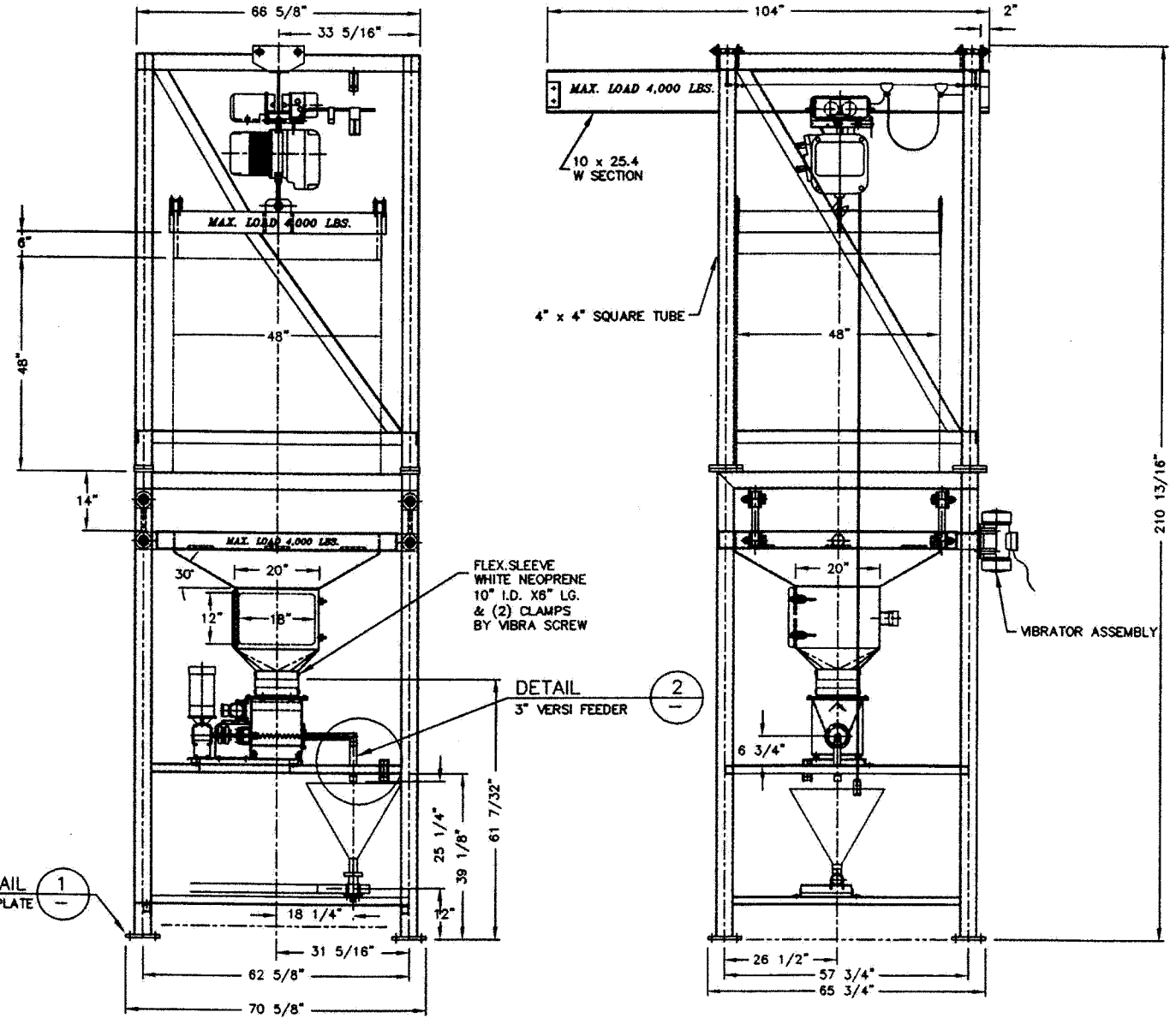
OU 1-07B ISB BURIED PIPE DETAILS

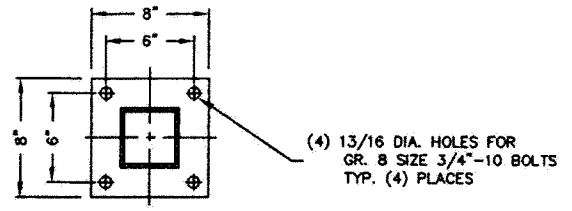
INTREPID Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

P-7

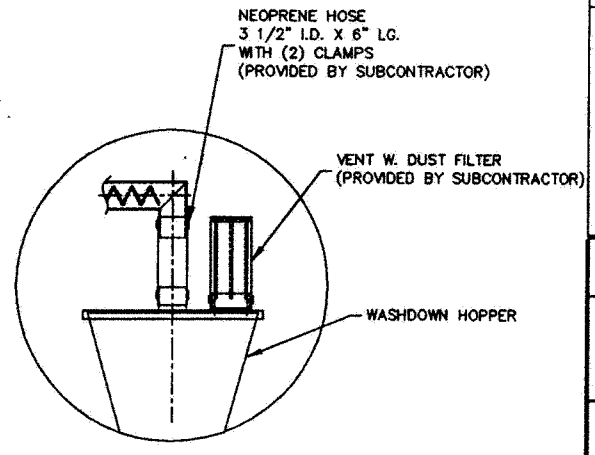
DRAWN: S. DUSTIN	10/17/02	TASK ORDER NUMBER	2000-058
DESIGNED: S. DUSTIN	10/17/02		
CHECKED: G. MECHAM	10/17/02	SAFETY CATEGORY:	03
APPROVED:		DRAWING NUMBER	10323
CADD FILE: 10322_0.DWG			REV 0

PROFESSIONAL ENGINEER REGISTERED 10712 9/3 STATE OF IDAHO J. SHAUN DUSTIN





DETAIL 1
BASEPLATE



DETAIL 2
3" VERSI FEEDER

REV	DWG	DESCRIPTION	BY	LEAD DATE	ENGR APP	P E APP

NOTES

1) EMPTY WEIGHT OF UNIT APPROX. 2800 LBS.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

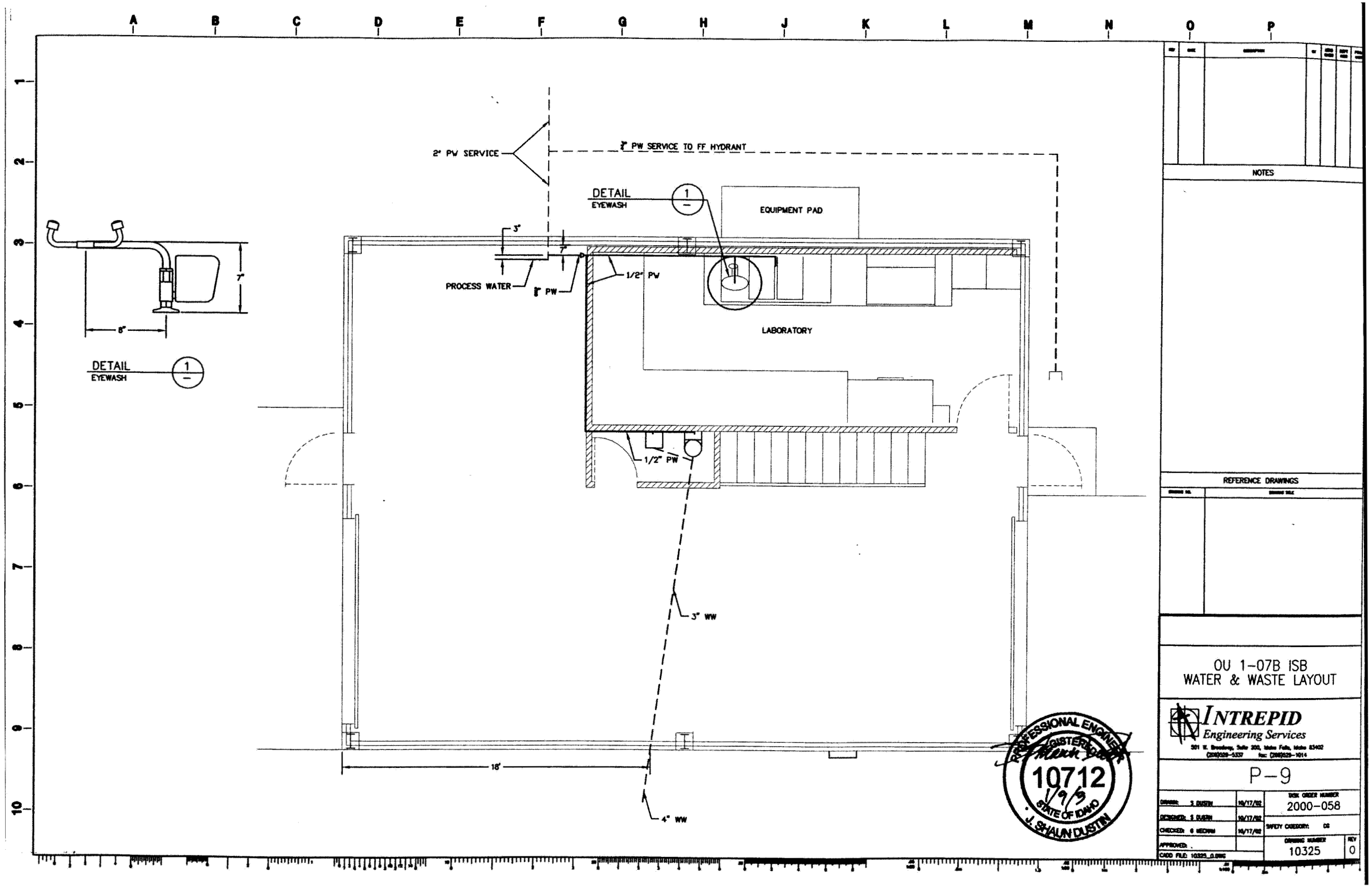
OU 1-07B ISB
BULK BAG UNLOADER

INTREPID
Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

P-8

DRAWN: K MECHAM	10/17/02	TASK ORDER NUMBER: 2000-058
DESIGNED: K KIMMELL	10/17/02	
CHECKED: G MECHAM	10/17/02	SAFETY CATEGORY: CG
APPROVED:		DRAWING NUMBER: 10324 REV: 0
CADD FILE: 10324_0.DWG		

PROFESSIONAL ENGINEER REGISTERED 1/6/03 7065 STATE OF IDAHO



NOTES

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

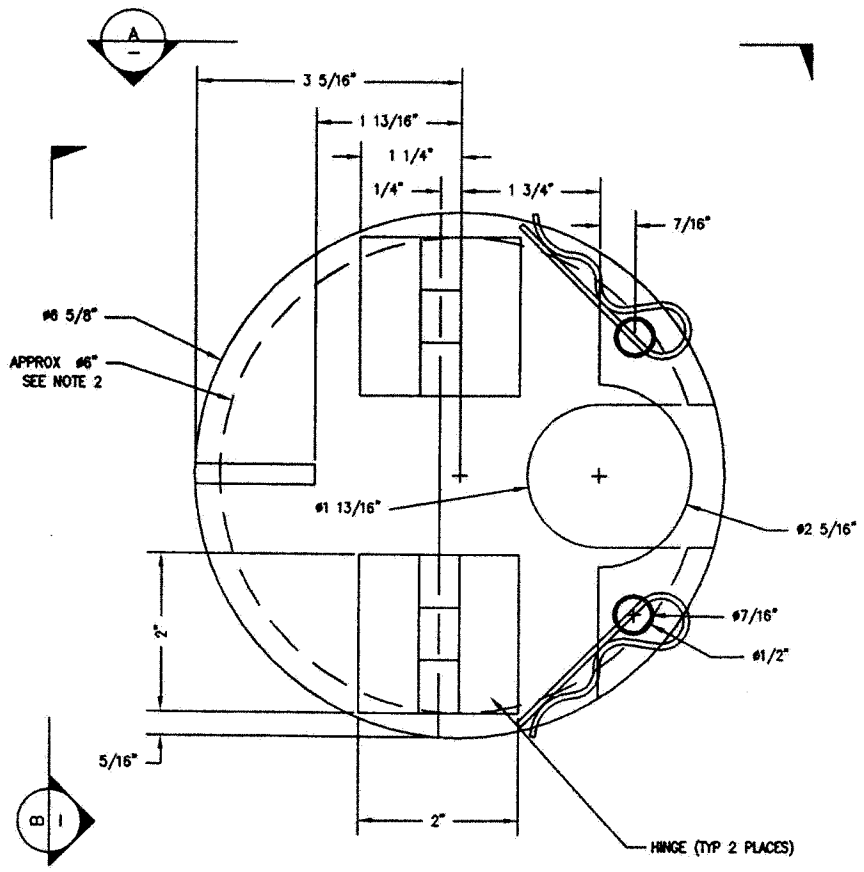
OU 1-07B ISB
WATER & WASTE LAYOUT

INTREPID
Engineering Services
301 E. Broadway, Suite 300, Idaho Falls, Idaho 83402
(208)529-3337 fax: (208)529-1014

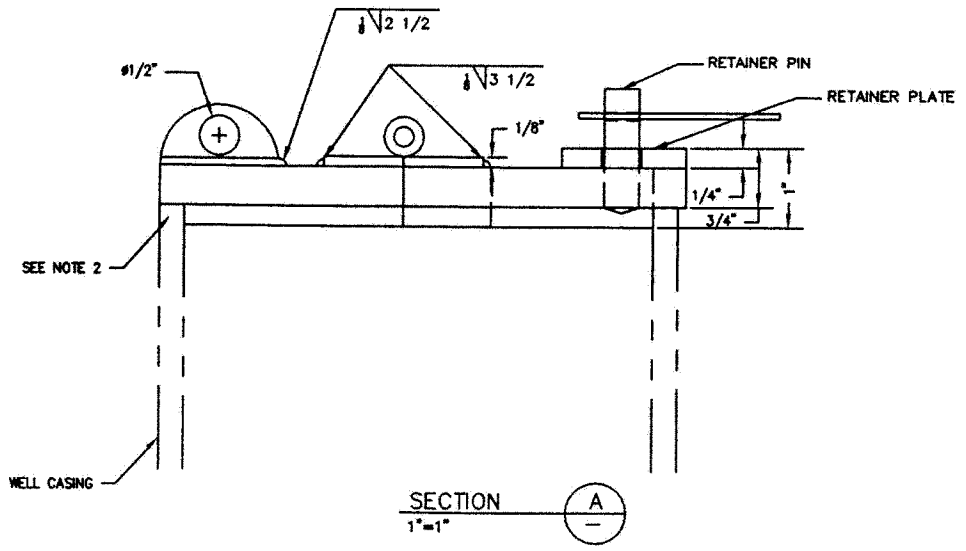
P-9

DRAWN: S DUSTIN	10/17/02	TASK ORDER NUMBER	2000-058
DESIGNED: S DUSTIN	10/17/02	SAFETY CATEGORY:	CS
CHECKED: G MEDINA	10/17/02	DRAWING NUMBER	10325
APPROVED:		REV	0
CADD FILE: 10325_0.DWG			

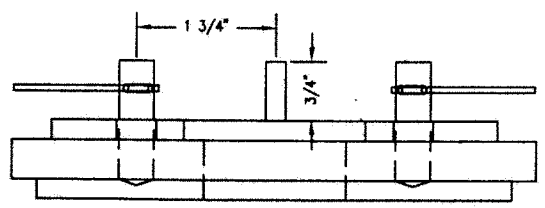
PROFESSIONAL ENGINEER
REGISTERED
10712
1/9/3
STATE OF IDAHO
J. SHAUN DUSTIN



DETAIL 5
INTERIOR WELL CAP, G-3
6" CASING
1"=1"



SECTION A
1"=1"



SECTION B
1"=1"

REV	DATE	DESCRIPTION	BY	LEAD DESIGN	DEPT MGR	PROJ MGR

NOTES

1) CONSTRUCT WELL CAP FROM CARBON STEEL

2) FABRICATOR SHALL ENSURE THAT WELL CAP WILL SLIP FIT INTO WELL CASING AS SHOWN

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

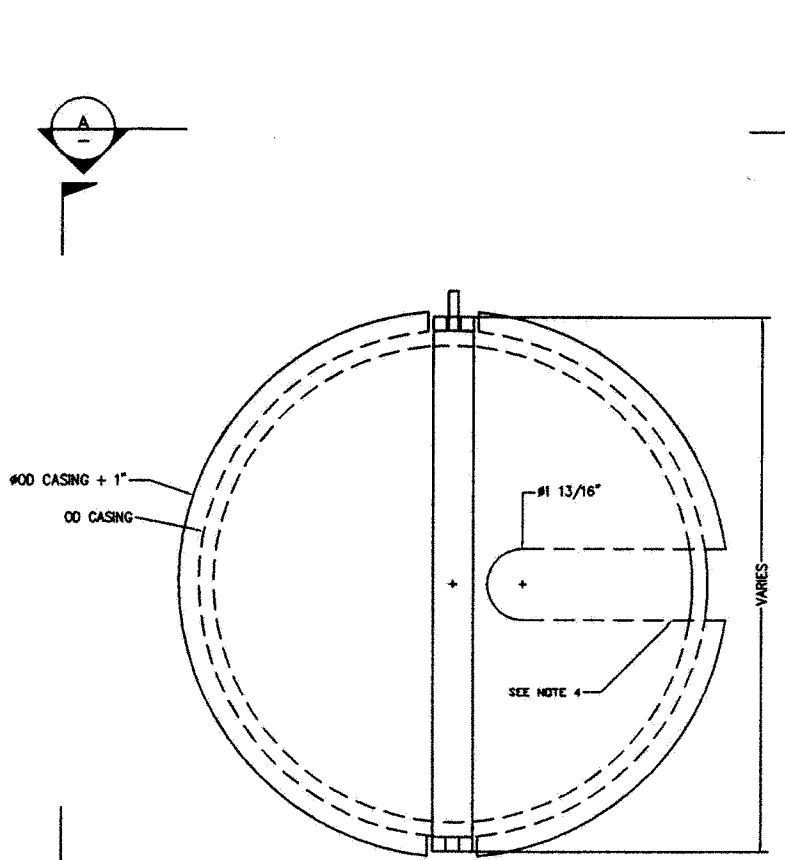
PROFESSIONAL ENGINEER REGISTERED 10712 1/9/3 STATE OF IDAHO J. SHAUN DUSTIN

OU 1-07B ISB
INTERIOR WELL CAP
6"ø CASING

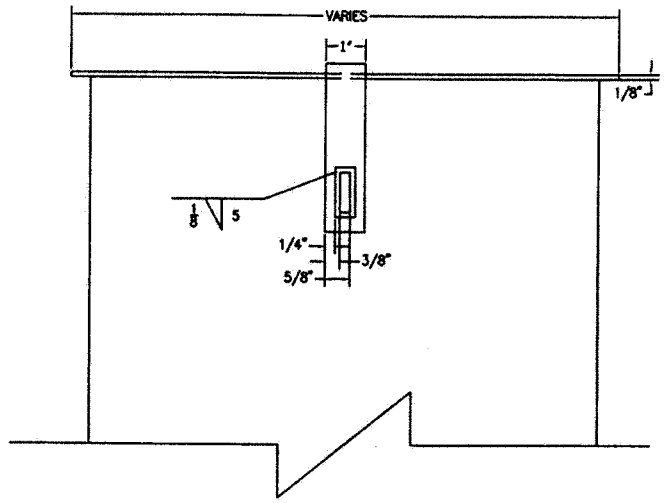
INTREPID Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

P-10

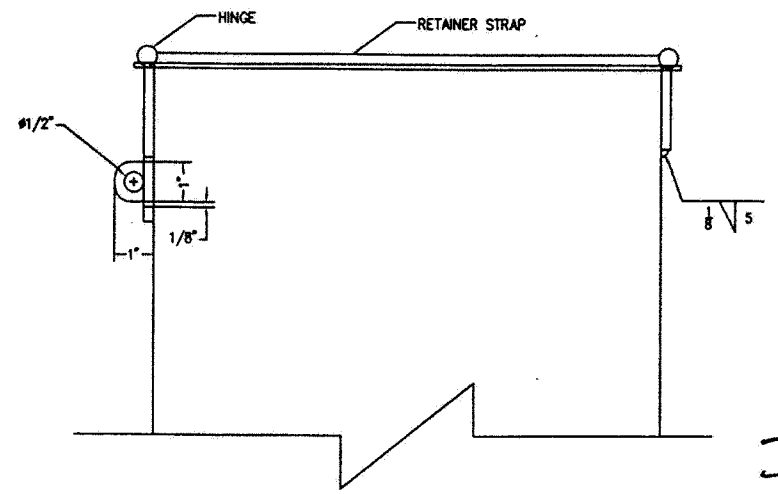
DRAWN: S DUSTIN	10/17/02	TASK ORDER NUMBER 2000-058
DESIGNED: S DUSTIN	10/17/02	
CHECKED: G MECHAM	10/17/02	SAFETY CATEGORY: CG
APPROVED:		DRAWING NUMBER 10326 REV 0
CADD FILE: 10326_0.DWG		



DETAIL 2
EXTERIOR WELL CAP, P-6
1/2"=1"



SECTION A
1/2"=1"



SECTION B
1/2"=1"

REV	DATE	DESCRIPTION	BY	LEAD ENGR	PROJ MGR	PROG MGR

NOTES

1) CONSTRUCT LOCKING WELL CAPS FROM CARBON STEEL.

2) INJECTION LINE NOT SHOWN FOR CLARITY.

3) OVERALL DIAMETER VARIES BASED ON SURFACE CASING DIAMETER. TO OD FOR EACH WELL WILL BE AS FOLLOWS:

TSF-05	13"
TAN-31	15"
TAN-37	17"
TAN-1859	17"

4) FIELD FIT NOTCH DEPTH IN LOCKING WELL CAP TO ALLOW INJECTION PIPE PENETRATION

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

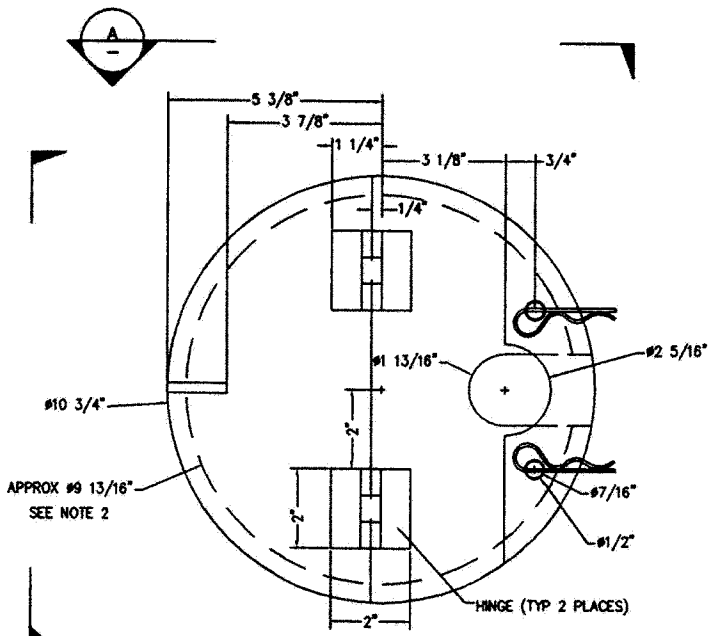
OU 1-07B ISB
EXTERIOR WELLCAP

INTREPID
Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

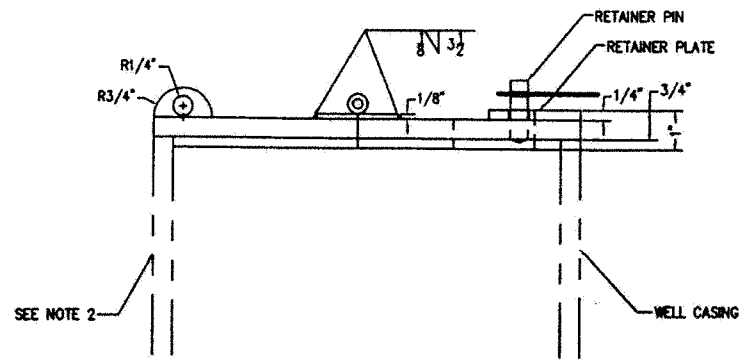
P-11

DRAWN: S DUSTIN	10/17/02	TASK ORDER NUMBER: 2000-058
DESIGNED: S DUSTIN	10/17/02	SAFETY CATEGORY: CB
CHECKED: G MECHAM	10/17/02	DRAWING NUMBER: 10327 REV: 0
APPROVED:		
CADD FILE: 10327_0.DWG		

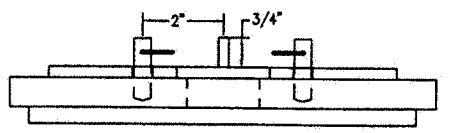
PROFESSIONAL ENGINEER REGISTERED 10712 STATE OF IDAHO J. SHAUN DUSTIN



DETAIL 3 / P-6
INTERIOR WELL CAP, 10" CASING 1/2"=1"



SECTION A / —
1/2"=1"



HINGES NOT SHOWN IN LEFT VIEW FOR CLARITY

SECTION B / —
1/2"=1"

NOTES

1) CONSTRUCT WELL CAP FROM CARBON STEEL

2) FABRICATOR SHALL ENSURE THAT WELL CAP WILL SLIP FIT INTO WELL CASING AS SHOWN

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

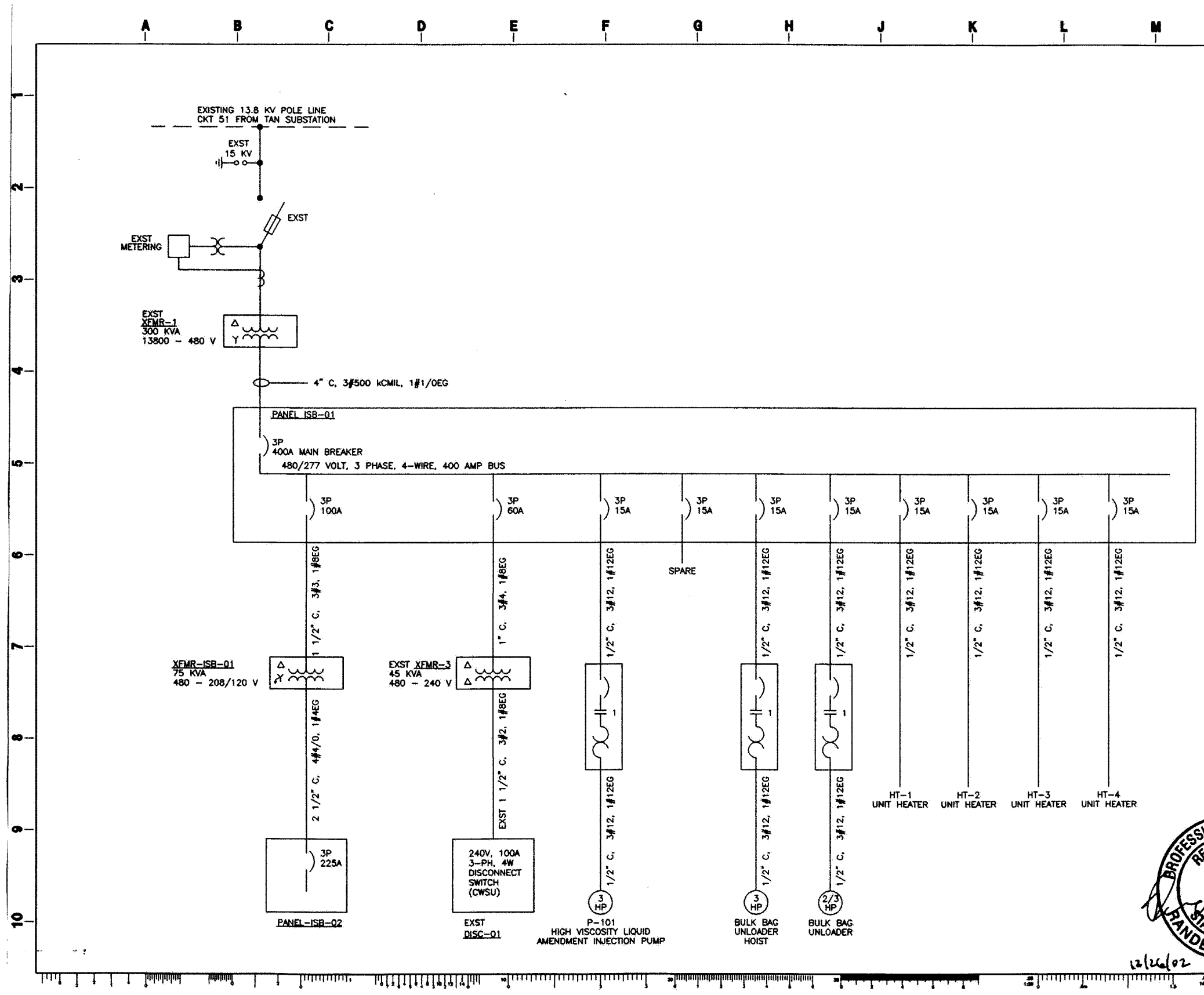
OU 1-07B ISB
TAN-1859 10" DIA. CASING

INTREPID
Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)528-6337 fax: (208)529-1014

PROFESSIONAL ENGINEER REGISTERED 10712 1/9/3 STATE OF IDAHO J. SHAUN DUSTIN

P-12

DRAWN: S DUSTIN	10/17/02	TASK ORDER NUMBER: 2000-058
DESIGNED: S DUSTIN	10/17/02	
CHECKED: G MECHAM	10/17/02	SAFETY CATEGORY: CG
APPROVED:		DRAWING NUMBER: 10328 REV: 0
CADD FILE: 10328_0.DWG		



REV	MADE	DESCRIPTION	BY	LEAD ENGR	DEPT MGR	PROJ MGR

NOTES

1) ALL WIRE IS COPPER UNLESS OTHERWISE NOTED.

2) ALL ELECTRICAL EQUIPMENT IS TO BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

OU 1-07B ISB
ONE-LINE DIAGRAM

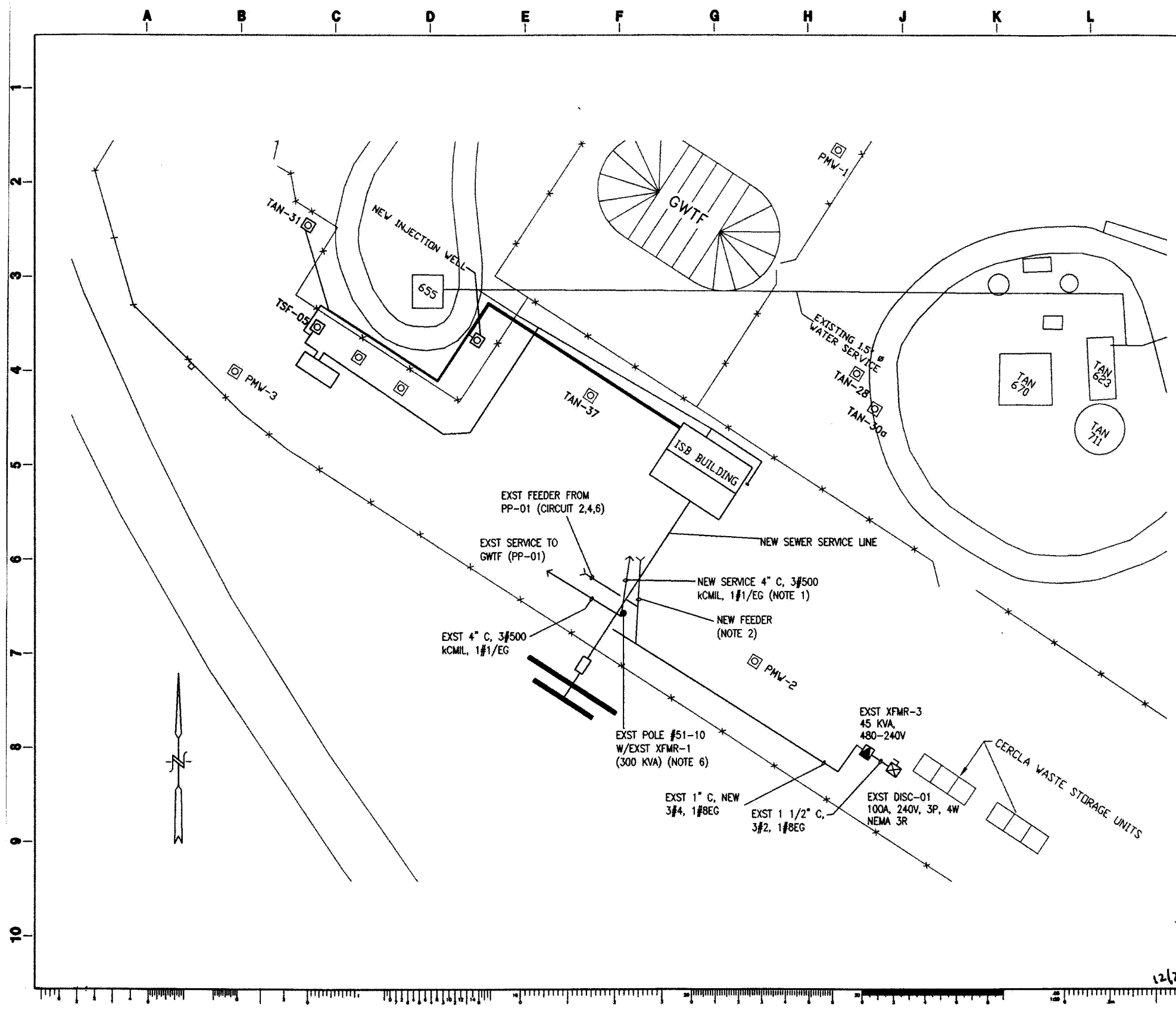
INTREPID
Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax (208)529-1014

E-1

DRAWN: R. VALERIO	10/17/02	TASK ORDER NUMBER	
DESIGNED: R. VALERIO	10/17/02	2000-058	
CHECKED: G. MECHAM	10/17/02	SAFETY CATEGORY:	OC
APPROVED:		DRAWING NUMBER	REV
CADD FILE: 10330_0.DWG		10330	0

PROFESSIONAL ENGINEER REGISTERED 9540 STATE OF IDAHO RANDEL G. VALERIO

12/26/02



REV	DATE	DESCRIPTION	BY	LEAD CHECK	DEPT MGR	PROJ MGR

NOTES

1) NEW SERVICE TO ISB BUILDING SHALL REPLACE EXISTING SERVICE TO GWTF. COORDINATE TRANSFER WITH OWNER. REUSE EXISTING SERVICE CONDUIT WHERE POSSIBLE. INSTALL NEW WIRE FROM EXISTING TRANSFORMERS TO NEW SERVICE PANEL (ISB-01). COORDINATE SERVICE CONDUIT ROUTING WITH OWNER.

2) INTERCEPT EXISTING CWSU FEEDER AND ROUTE NEW CONDUIT TO NEW ISB BUILDING PANEL (ISB-01). INSTALL NEW WIRE FROM ISB PANEL TO EXISTING CWSU TRANSFORMER.

3) ALL ELECTRICAL EQUIPMENT IS TO BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE.

4) CONDUIT TO BE BURIED A MINIMUM OF 24 INCHES BELOW GRADE WITH APPROPRIATE WARNING RIBBON.

5) CONDUIT TO BE RIGID METAL IF ABOVE GROUND AND INSTALLED PER LATEST EDITION OF THE NATIONAL ELECTRICAL CODE FOR ITS INTENDED USE.

6) CONFIGURE EXISTING TRANSFORMERS (XFMR-1) FOR DELTA-WYE CONNECTION AS REQUIRED AND SHOWN ON DRAWING SHEET E-1. EXISTING TRANSFORMERS ARE NUMBERED 5912, 5913, AND 5914.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

PROFESSIONAL ENGINEER REGISTERED 9640 STATE OF IDAHO RANDEL G. VALERIO

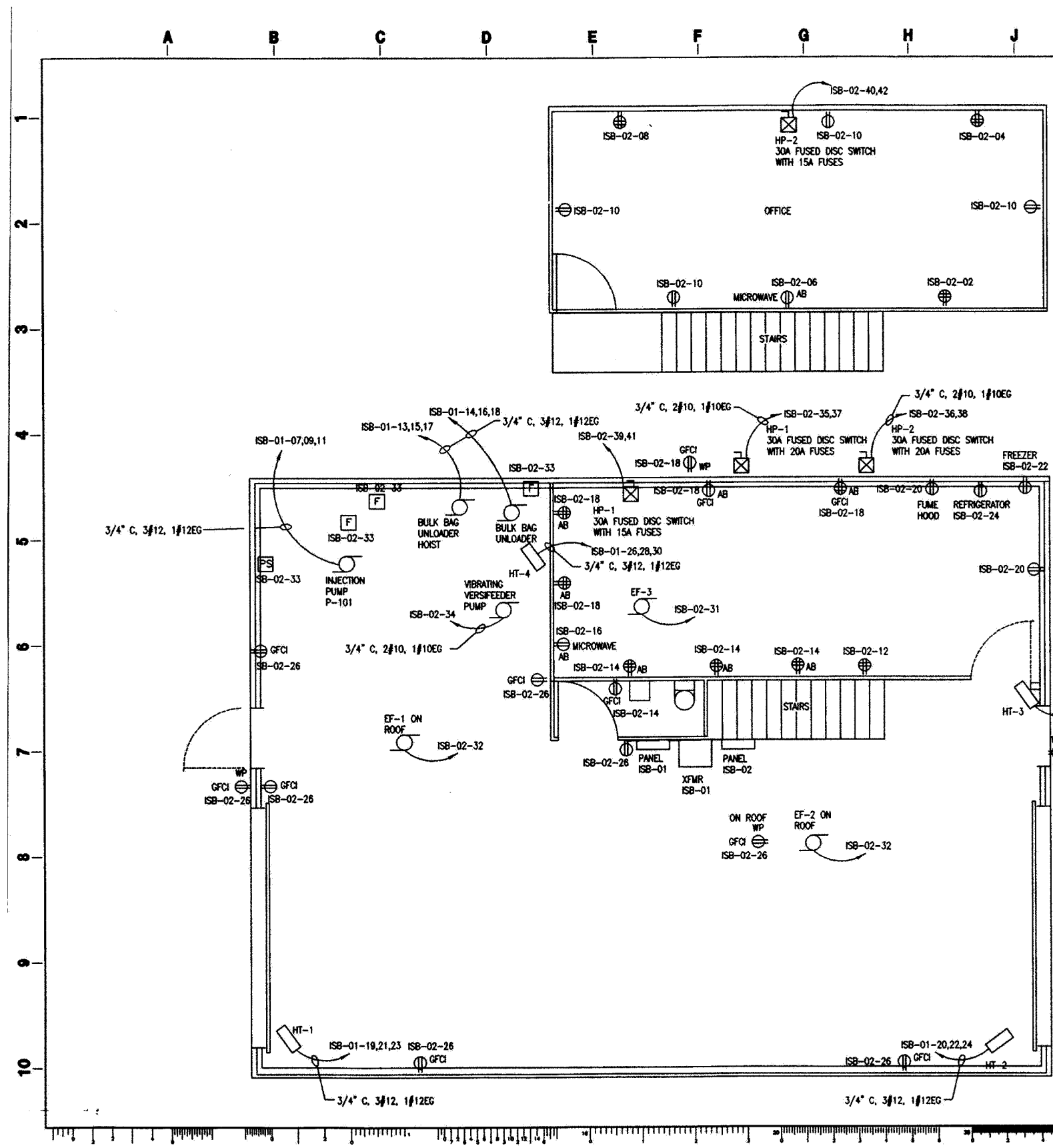
12/26/02

OU 1-07B ISB ELECTRICAL SITE PLAN

INTREPID Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

E-2

DRAWN: R VALERIO	10/17/02	TASK ORDER NUMBER 2000-058
DESIGNED: R VALERIO	10/17/02	
CHECKED: G MECHAM	10/17/02	SAFETY CATEGORY: CC
APPROVED:		DRAWING NUMBER 10331 REV 0
CADD FILE: 10331_0.DWG		



LEGEND

- ⊕ – QUAD OUTLET RECEPTACLE
- ⊕ – DUPLEX OUTLET RECEPTACLE
- AB – ABOVE COUNTER HEIGHT (46" TO CENTER OF BOX)
- WP – WEATHERPROOF
- GFCI – GROUND FAULT CIRCUIT INTERRUPTER
- – PUMP/MOTOR LOAD
- F – FLOW METER, 120 VAC
- – FUSED DISCONNECT SWITCH
- PS – PRESSURE SWITCH

REV	DATE	DESCRIPTION	BY	LEAD ENGR	BODY MGR	PROJ MGR

NOTES

1) ALL ELECTRICAL EQUIPMENT IS TO BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTIRCAL CODE.

2) ALL CIRCUITS 1/2" CONDUIT WITH 2#12, 1 #12 GROUND UNLESS OTHERWISE INDICATED.

3) MOTOR CIRCUITS SHALL BE ROUTED THROUGH COMBINATION MOTOR STARTER/DISCONNECTS WITH HAND/OFF/AUTO AS INDICATED ON SHEET E-1. CONDUIT AND WIRE INDICATED FOR SIZE ONLY.

4) PRESSURE SWITCH SHALL CONTROL SHUTOFF FOR INJECTION PUMP (P-101). ROUTE OUTPUT TO PUMP CONTROLLER.

5) PROVIDE DISCONNECT FOR ALL EQUIPMENT PER LATEST EDITION OF THE NATIONAL ELECTRICAL CODE WHETHER INDICATED OR NOT. VERIFY MANUFACTURER'S RECOMMENDED EQUIPMENT AND RATINGS.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

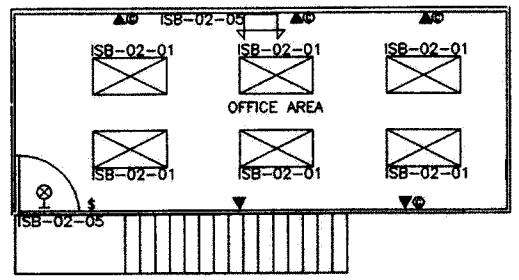
OU 1-07B ISB
ELECTRICAL POWER PLAN

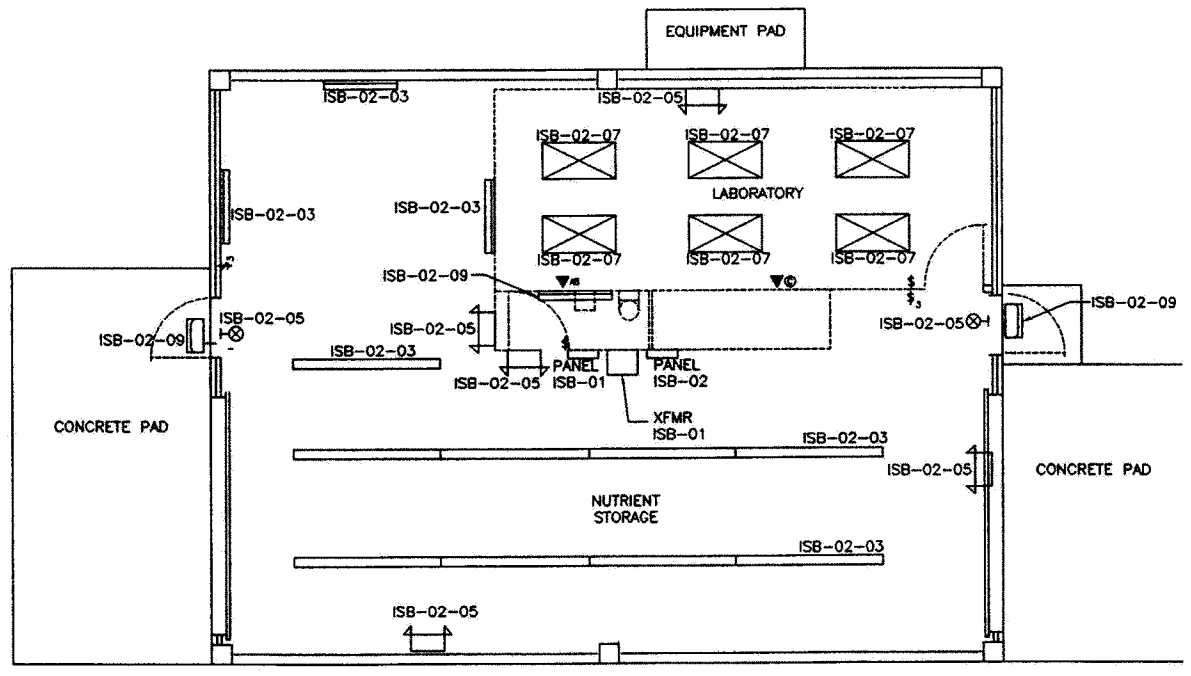
INTREPID
Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

E-3

DRAWN: R VALERIO	10/17/02	TASK ORDER NUMBER	2000-058
DESIGNED: R VALERIO	10/17/02	SAFETY CATEGORY:	CC
CHECKED: G MECHAM	10/17/02	DRAWING NUMBER	10332
APPROVED:		REV	0
CADD FILE: 10332_0.DWG			

PROFESSIONAL ENGINEER REGISTERED 9640 STATE OF IDAHO RANDEL G. VALERIO
12/26/02





LEGEND

- FLUORESCENT LIGHT FIXTURE 8'-0" LONG, CHAIN/PENDENT HUNG AT 10'-0" AFF TWO-59W T8 LAMPS, WIREGARD COVER
- FLUORESCENT LIGHT FIXTURE 4'-0" LONG, WALL MOUNT AT 10'-0" AFF TWO-32W T8 LAMPS, LENS COVER
- FLUORESCENT LIGHT FIXTURE 4'-0" LONG, GRID MOUNT FOUR-32W T8 LAMPS, LENS COVER
- WAL-PAK LIGHT FIXTURE 70 WATT HPS LAMP, 120 VAC WITH PHOTO ELECTRIC SENSOR (DARK-SKY COMPLIANT)
- EMERGENCY LIGHT FIXTURE TWO HEAD
- EXIT LIGHT, LED TYPE (RED) WITH BATTERY BACKUP
- $ TOGGLE SWITCH
- $_3 TOGGLE SWITCH - 3 WAY
- ▲ TELEPHONE OUTLET
- © COMMUNICATIONS/DATA OUTLET
- AB ABOVE COUNTER HEIGHT (46" TO CENTER OF BOX)

REV	DATE	DESCRIPTION	BY	LEAD DESIGN	DEPT MGR	PROJ MGR

NOTES

1) ALL ELECTRICAL EQUIPMENT IS TO BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTIRCAL CODE.

2) EMERGENCY LIGHTS AND EXIT LIGHTS SHALL BE WIRED TO LIGHT CIRCUIT AS INDICATED (HOT) AHEAD OF SWITCHES.

3) ALL CIRCUITS 1/2" CONDUIT WITH 2#12, 1 #12 GROUND UNLESS OTHERWISE INDICATED.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

PROFESSIONAL ENGINEER REGISTERED 9640 STATE OF IDAHO RANDEL G. VALERIO

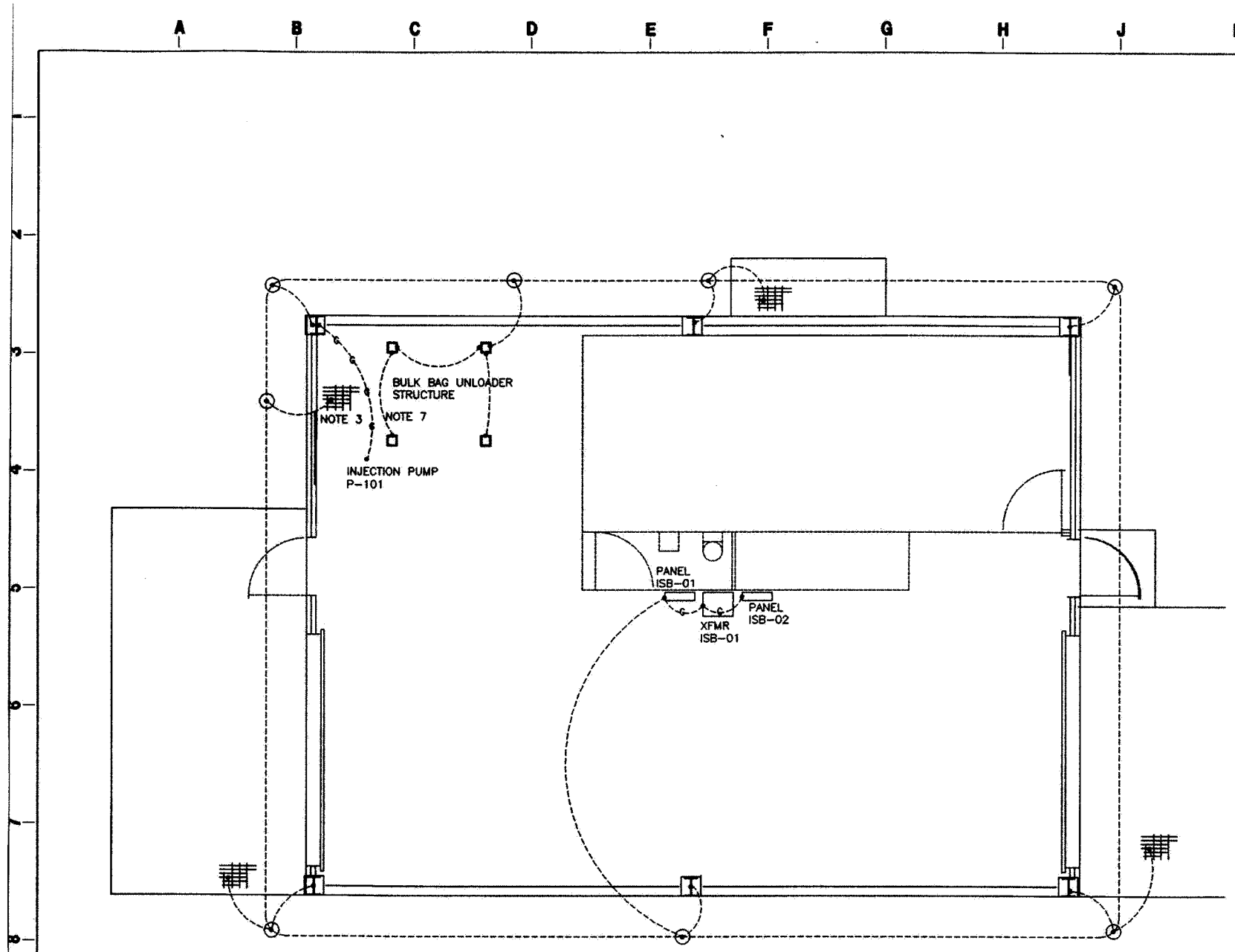
12/26/02

OU 1-07B ISB LIGHTING/ANCILLARY PLAN

INTREPID Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

E-4

DRAWN: R VALERIO	10/17/02	TASK ORDER NUMBER	2000-058
DESIGNED: R VALERIO	10/17/02	SAFETY CATEGORY: CG	
CHECKED: G MECHAM	10/17/02	DRAWING NUMBER	REV 0
APPROVED: .		10333	
CADD FILE: 10333_0.DWG			



LEGEND

- EMBEDDED GROUND WIRE (BARE #2 COPPER)
- EXPOSED GROUND WIRE (BARE #6 COPPER)
- GROUND ROD
- GROUND CONNECTION

REV	DATE	DESCRIPTION	BY	LEAD ENGR	CNSTR MGR	PROJ MGR

NOTES

1) ALL ELECTRICAL EQUIPMENT IS TO BE GROUNDED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE.

2) INSTALL GROUND ROD AS SHOWN, 3/4" X 10'-0" LONG. CONNECT BUILDING GROUND LOOP OF #2 BARE COPPER GROUND WIRE TO RODS USING EXOTHERMIC OR UL LISTED COMPRESSION CONNECTIONS.

3) INSTALL #2 BARE COPPER GROUND LOOP 2'-6" MINIMUM BELOW GRADE. CONNECT FOUNDATION REBAR TO GROUND LOOP AT 20'-0" INTERVALS.

4) TEST GROUNDING SYSTEM RESISTANCE AND MODIFY AS NECESSARY BY ADDING ADDITIONAL GROUND RODS AND/OR TREATING SOIL TO OBTAIN RESISTANCE BELOW 5 OHMS (MAXIMUM).

5) BUILDING COLUMNS TO BE CONNECTED TO GROUND LOOP USING #2 BARE COPPER GROUND WIRE. SEAL ALL WIRE/CABLE PENETRATIONS AFTER INSTALLATION.

6) ROUTE AND ATTACH EQUIPMENT FRAME GROUND SO AS TO NOT CREATE A TRIPPING HAZARD. FASTEN TO EQUIPMENT FRAMES USING COMPRESSION LUGS AND BOLTS.

7) ATTACH EQUIPMENT GROUND TO ALL PUMPS INSTALLED ON STRUCTURE.

8) ATTACH EQUIPMENT GROUND TO ALL FLOW METERS, GAUGES AND EQUIPMENT REQUIRING POWER (MINIMUM SIZE #12). PROVIDE GROUNDING BUSHING ON CONTROL CONDUITS TO ALLOW GROUND TERMINATION.

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

PROFESSIONAL ENGINEER REGISTERED 8640 STATE OF IDAHO RANDEL G. VALERIO

12/26/02

OU 1-07B ISB BUILDING GROUNDING PLAN

INTREPID Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

E-5

DRAWN: R VALERIO	10/17/02	TASK ORDER NUMBER 2000-058
DESIGNED: R VALERIO	10/17/02	
CHECKED: G MECHAM	10/17/02	SAFETY CATEGORY: CG
APPROVED: .		DRAWING NUMBER 10334 REV 0
CADD FILE: 10334_0.DWG		

Panel ID: ISB-01
Location: ISB Building
Fed From: XFMR-1 Pole Mounted (Service)
Panel A.I.C. Rating: 14,000 Amperes

PANEL SCHEDULE
Three Phase

Bus Rating: 400 Amperes w/ 400 Amp Main Breaker
Voltage: 277/480 Volts
Wire Configuration: 3 Phase, 4 Wire
Mounting Type: Surface, Bottom Fed

	Circuit Description	Load (VA) A	Load (VA) B	Load (VA) C	Code	Breaker	BUS	Breaker	Code	Load (VA) A	Load (VA) B	Load (VA) C	Circuit Description	
1		10514			P		A		Z	15000				2
3	XFMR ISB-01 (Panel ISB-02)		9952		P	100/3	B	60/3	Z		15000		XFMR-03 (Disc-01)	4
5				10104	P		C		Z			15000		6
7		1330			M		A			0				8
9	Injection Pump P-101		1330		M	15/3	B	15/3			0		Spare	10
11				1330	M		C					0		12
13		1330			M		A		M	443				14
15	Bulk Bag Unloader Hoist		1330		M	15/3	B	15/3	M		443		Bulk Bag Unloader	16
17				1330	M		C		M			443		18
19		1830			H		A		H	1830				20
21	Unit Heater HT-1		1830		H	15/3	B	15/3	H		1830		Unit Heater HT-2	22
23				1830	H		C		H			1830		24
25		1830			H		A		H	1830				26
27	Unit Heater HT-3		1830		H	15/3	B	15/3	H		1830		Unit Heater HT-4	28
29				1830	H		C		H			1830		30
31	Spare	0				20/1	A	20/1		0			Spare	32
33	Spare		0			20/1	B	20/1			0		Spare	34
35	Spare			0		20/1	C	20/1				0	Spare	36
37	Spare	0				20/1	A	20/1		0			Spare	38
39	Spare		0			20/1	B	20/1			0		Spare	40
41	Spare			0		20/1	C	20/1				0	Spare	42
	Left Side	16834	16272	16424		Total VA	106839			19103	19103	19103	Right Side	

129 amps

Panel ID: ISB-02
Location: ISB Building
Fed From: ISB-01 thru Xfmr ISB-01
Panel A.I.C. Rating: 10,000 Amperes

PANEL SCHEDULE
Three Phase

Bus Rating: 225 Amperes w/ 225 Amp Main Breaker
Voltage: 120/208 Volts
Wire Configuration: 3 Phase, 4 Wire
Mounting Type: Surface, Bottom Fed

	Circuit Description	Load (VA) A	Load (VA) B	Load (VA) C	Code	Breaker	BUS	Breaker	Code	Load (VA) A	Load (VA) B	Load (VA) C	Circuit Description	
1	Office Lights	780			L	20/1	A	20/1	S	500			Office Desk	2
3	Nutrient Lights		1320		L	20/1	B	20/1	S		500		Office Desk	4
5	Emergency & Exit Lights			375	L	20/1	C	20/1	A			1500	Office Microwave	6
7	Laboratory Lights	780			L	20/1	A	20/1	S	500			Office Desk	8
9	Bathroom & Exterior Lights		215		L	20/1	B	20/1	R		720		Office Outlets	10
11	Spare			0		20/1	C	20/1	S			500	Laboratory Desk	12
13	Spare	0				20/1	A	20/1	R	1260			Laboratory Counter Outlets	14
15	Spare		0			20/1	B	20/1	A		1500		Laboratory Microwave	16
17	Spare			0		20/1	C	20/1	R			1440	Laboratory Counter Outlets	18
19	Spare	0				20/1	A	20/1	S	680			Laboratory Fume Hood	20
21	Spare		0			20/1	B	20/1	A		1000		Laboratory Freezer	22
23	Spare			0		20/1	C	20/1	A			750	Laboratory Refrigerator	24
25	Spare	0				20/1	A	20/1	R	1620			Nutrient Outlets	26
27	Spare		0			20/1	B	20/1			0		Spare	28
29	Spare			0		20/1	C	20/1				0	Spare	30
31	Exhaust Fan EF-3	432			M	15/1	A	15/1	M	864			Exhaust Fans EF-1 & EF-2	32
33	Flow Meters & Pressure Switch		600		Z	15/1	B	25/1	LM		1656		Vibrating Versifeeder Pump	34
35	Heat Pump HP-1 (outdoor)			1555	M	20/2	C	20/2	M			1543	Heat Pump HP-2 (outdoor)	36
37		1555			M		A		M	1543				38
39	Heat Pump HP-1 (indoor)		1255		M	15/2	B	15/2	M		1186		Heat Pump HP-2 (indoor)	40
41				1255	M		C		M			1186		42
	Left Side	3547	3390	3185		Total VA	30570			6967	6562	6919	Right Side	

85 amps

NO.	DATE	DESCRIPTION	BY	ELEC	MECH	PROC

NOTES

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

OU 1-07B ISB
PANEL SCHEDULES

INTREPID Engineering Services
501 W. Broadway, Suite 200, Idaho Falls, Idaho 83402
(208)529-5337 fax: (208)529-1014

E-6

DRAWN: R VALERIO	10/17/02	TASK ORDER NUMBER	2000-058
DESIGNED: R VALERIO	10/17/02	SAFETY CATEGORY:	CC
CHECKED: G MECHAM	10/17/02	DRAWING NUMBER	10335
APPROVED: .	.	REV	0
CADD FILE: 10335_0.DWG			

PROFESSIONAL ENGINEER REGISTERED 9840 STATE OF IDAHO RANDEL G. VALERIO
12/26/02